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EDITORIAL.

THE ORGANIZATION OF HOSPITAL STAFFS.

There are few physicians in actual practice to-day whose professional work does not lead by some path or other through the doors of some hospital. Therefore, any discussion which deals with the best methods of hospital administration should afford interest to a very wide circle. Within the last few months several articles relating to the organization of medical and surgical staffs have appeared, and have thrown light on the method by which some of the best managed hospitals in the country are governed. All these discussions, while differing in minor details, are strikingly unanimous in their underlying principles, and all show a definite attempt to adopt business administration ideas to their particular problems. The saddest comment which can be made on the medical organization of hospitals, and one which unfortunately is too often called for, is that they are frequently run on the principle of the laws of entail. At one time most of the institutions in a great city were family affairs in which *pater familias* dispensed positions as freely as honors were bestowed under the feudal system; but now most large hospitals realize the folly of such a system, and are yielding to the fundamental ideas of civil service. That efficiency should be the only qualification for position on a hospital staff is an axiom which forms the basis for the scheme now to be outlined. Unless political influence, graft with the board of directors or other powers, can be eliminated, there is no use attempting to establish a working whole devoted entirely to the interests of the institution.

In all large hospitals dealing with public patients, whether privately endowed or under municipal or county control, the various services are sharply defined, and each is a unit unto itself. The general laws applying to one unit will, with slight modifications, apply to all. It seems to

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be generally agreed by every one interested in the problem that the highest efficiency can be obtained only when each service is under the control of one man. This "head of the department" must have under his wing several associates whose duties, whether in the ward, the operating room, the dispensary, or the laboratory, are such as bring him into direct contact with some or all of the patients. If the hospital is connected with a medical school—as, in our opinion all hospitals dealing with public patients should be,—then the various associates on the staff will have duties bringing them into direct contact with the students. It is an accepted fact in all business administration that perfect efficiency is possible only by division of and specialization in labor; and while one man can easily enough work his way through all steps of the system, he is, during the time of his association in one department, a specialist in the work of that department. So it should be in a hospital if the institution is to amount to anything more than a mere haven for the tired or sick poor. One attending man on a service at a time in a large hospital cannot possibly look after the mere physical needs of his patients, much less direct and initiate those studies along lines of clinical research which rightly should emanate from a first-class hospital. The younger men on the staff, men whose practices are perhaps not yet overwhelming, can and should be given the task of directing the various fields of action necessary in a large clinic.

The value of specialization can be seen no better than in the relation of clinic to laboratory. The time has passed when all the laboratory work of a hospital can be classed under the head of pathology, and done by one man—often a practitioner paid a small salary for a part of his time daily; but such hospitals still exist as a blot on the escutcheon of American medicine. It is a crying disgrace that large publicly managed institutions can exist in this country with laboratory facilities such as would be considered eminently insufficient for the smallest of German clinics. Not only is the field of post mortem and surgical pathology woefully neglected in some of our country institutions, but the even more important field of so-called clinical pathology is frequently occupied by a junior interne working under no general. From every standpoint, be it that of patient, attending man, or institution, the special part of laboratory work dealing directly with the patients should be under the direction of a man who also is intimately associated with the patient; and the most feasible scheme for attaining this end is by having the work controlled by one of the associates especially assigned to this division. What has been said about the laboratory holds as well for any other department of a service, and the men who have been studying the problem recognize the prime importance of the idea and recommend its adoption.

Naturally, details of organization must vary with the needs of the institution. For small private hospitals conducted by physicians or surgeons for their private cases, no rules can be laid down. It seems, however, well worth the attention of all American physicians to study ways and means of improving our public hospitals so that they may occupy the positions in the advance of medical ideals which they rightly should.

A NEW FIELD FOR LIFE INSURANCE EXAMINATIONS.

Annual life insurance examinations now seem about to become an ordinary routine of business if we are to believe the preliminary statements of some of the companies. Of course the best sign of good health is the very fact that the man never gives it a thought; if he does think of it, except in a casual way, he surely is sick and in need of treatment. The illness may be merely an exhaustion, but it is the trivial things which become serious with time. No machine is ever allowed to run long without a critical examination to find if there is not a worn or damaged part which does not give symptoms, but which constitutes a weak spot, sure to break under an extra strain, and needing to be strengthened. Examinations also show if there is undue wear from some tiny loss of adjustment or alignment, and this is where the analogy to man is very close, for he too wears in spots if he is out of adjustment. A very slight change in a machine's position or a man's method of work makes all the difference in the way of smooth running, increased efficiency, and prolonged work-life.

Mere lengthening of life in not desirable of itself, for nothing is more miserable than a long life of invalidism, yet the primary purpose of the proposed periodic life insurance examinations is to prolong life and thus cheapen insurance to all. The only one whose estate receives exactly what he paid out in dividends is he who lives the average time, not counting of course the expenses of management, which probably are less than if he saved the money and invested it himself. Those who live the longest pay out more than the estate gets back, and if one were sure he would live and save, it would be cheaper not to insure. As no one knows when he will be called, no one can run the risk of dying before he has provided for his family, and we all must insure. Besides, few save except under compulsion. Those who live the longest need not fret about having paid too much for the insurance, but may thank heaven they are the instruments of charity to the widows and orphans of those who die prematurely. It is really the mutual aid upon which social organization is

based. If we could only prevent agents from working on one's fears and inducing a man to take out more insurance than be can carry, thus losing most of it when he surrenders the policy; and if we could end those companies which charge too little and go to the wall when the time comes to pay off the early policies, insurance would be cheaper still. As it is a social necessity, it must be put within the reach of all, to end the present intolerable burdens of supporting the helpless and paupered.

Prolongation of efficiency is the real purpose of annual examinations. Death in harness is the ideal end; that is, our duty is to make a man an efficient worker all of a long life, and not merely patch him up to live after all working power is gone. We can do this by periodical examinations to find out where the machine is wearing from undue friction. We need not be afraid of turning men into introspective cranks, for if they are healthy they immediately forget all abount the examination, and if really ill, they must take heed. It is the neglected who become unduly solicitous. Military services the world over are making it a rule to examine frequently to exclude the unfit, and, as far as known, it is doing a world of good in the direction of preventing unfitness, so that there will be fewer retirements, not more. We might, then, suggest that these new life insurance examinations take on more of the nature of increasing and prolonging efficiency as well as mere life. They are more than public health measures, and we are safe in predicting that the new movement will become universal. Not only that, but compulsory examinations will go hand in hand with the compulsory universal insurance now part and parcel of the highest civilizations. Our boasted individualism is at an end, not only because it is too expensive, but also because it is inefficient. We are more and more dependent on society, and must play fair or we will be outcasts. It is a man's duty to society to avoid the damages which make him a pauper. He must keep himself in the harness as long as possible. It does seem that life insurance medical men are destined to fill a much larger place in civilization than their original one of preventing insurance to those who are liable to die soon.

By the way, too, it is high time that some kind of insurance be devised for the "uninsurable." Indeed, as it is a social necessity, there should be no difficulty in creating a new class with special premiums, and if the man does outlive expectations, then increase his policy according to payments already made. So many uninsurable men live past sixty that it is bad business to let them go uninsured. It is possible for every man to get insurance—even if incurably diseased—so let it be done at once. Our actuaries could easily calculate premiums to be paid without any examinations at all—merely stipulating that the longer one lives the bigger will

be the death payments, and the less the premiums. "Grave-yard insurance" would never be heard of, if this old suggestion could be made practicable.

In addition to all this, it has been fully predicted that life insurance examiners will take on the role of sanitary inspectors, for they may find the primary causes of early disease, whereas the physician called in long afterwards, when symptoms are pronounced, may be puzzled or even baffled if the primary cause has been removed. In every way we look at it, the extension of insurance to every one is bound to make profound social changes. We might also remark that if people are to be given public aid when sick, as the English government proposes, it will be a crime to make one's self sick, and a misdemeanor to neglect preventive measures. Consequently, the observance of hygiene and sanitation will probably be much more compulsory than now. Public health cannot fail to be improved where it is criminal to neglect ways of preserving health, efficiency and life, and to become a public burden. So let us have more insurance and more examinations. The companies are more than public utilities; they seem destined to be part and parcel of the social machine itself.

SOME NEW TESTS FOR CANCER.

Some time ago we called attention in these pages to a new test for cancer of the stomach, the "glycyl-tryptophan" reaction of Neubauer and Fischer, as well as to the modification proposed by Weinstein, of New York. At the time of the publication of the original note sufficient observation had not yet been made to allow a just estimate of the value of the test. Since then a very extensive literature has accumulated, which has recently been judicially reviewed by Weinstein. As usual with the new things in medicine, the period of enthusiasm was followed by much discouragement, and considerable skepticism, and even now opinion is far from settled on the exact value of the reaction. Warfield was the first to explain some of the apparent discrepancies by the assumption that saliva swallowed and then removed as part of a test meal would act in respect to the test just as the proteolytic ferment of cancer, and consequently would be a source of grave error in the interpretation of the results obtained with the original test of Neubauer and Fischer. Weinstein, however, found by direct experiment that saliva had no effect on the validity of the test applied according to his modification. This modification, it may be remembered, consists in excluding the addition of glycyl-

tryptophan to the gastric contents, thereby considerably simplifying the technique. It is assumed that if the cancer ferment is present, tryptophan will be demonstrable as a result of the action of the ferment on the food in the stomach. With this change in technique, Weinstein has obtained results of comparative but not absolute value, but most other investigators are less satisfied with even its comparative usefulness.

Based on the same principle that cancer cells secrete a ferment capable of splitting protein, Morris of St. Louis, has attempted to find a means of making a definite diagnosis of malignancy in ascitic fluids. At present even the best methods at the command of the laboratory worker cannot give much information concerning the nature of such fluid, and all specific tests so far have proved worse than useless. Morris has found, in a small series of cases studied, that in malignant disease of the peritoneal cavity, the fluid contains considerably more incoagulable nitrogen than does the fluid from other conditions. To remove the coagulable nitrogen is by no means a simple procedure, and as at present conducted cannot be performed outside of a well-regulated laboratory. But the principle is so sound that it seems to us to promise very well, and undoubtedly subsequent work will simplify the technique.

OPINION AND CRITICISM.

SPORADIC TRICHINOSIS.

"An epidemic of a disease like typhoid fever following close on to a picnic should suggest an epidemic of trichinosis." Words similar to these are found in a well-known textbook of practice. The writer of this note well remembers, in the wards of a large institution where trichinosis was extremely rare, a patient lying for some time with suspected typhoid fever without the specific blood findings. A belated differential count showing an eosinophilia finally led to the correct diagnosis of trichinosis. Many cases of trichinosis are probably diagnosed as typhoid fever in the early stages, or as peripheral neuritis in the later periods,—and the mistake is made usually because the real disease is not being looked for.

As a matter of fact, the diagnosis of trichinosis is far from difficult, and more cases would undoubtedly be met with were the clinical syndrome emphasized. Often epidemic in a group of persons who have been eating infected meat, it may and often does occur sporadically in an individual who does not even remember pork in his dietary. An onset much like typhoid fever with malaise, fever, slight edema of the eyelids, general or local muscle pains, a trace of albumen in the urine, and an eosinophilia, almost always spells a trichina infection. The muscle pains are often not found till later, but the study of the blood showing the abscess of typhoid reactions and the presence of a large increase in the eosinophiles with the edema of the eyelids and trace of albumen make a clinical syndrome. This combination is not met with in any other infection. If this group of signs and symptoms is present, a case of sporadic trichinosis must be considered, and subsequent development of muscle pains should lead to the finding of the trichina in a piece of excised muscle. The excising of a small fibre of muscle is attended with so little discomfort that most patients do not object to the "harpooning process"; and the remainder of the technique is very simple. The small piece of muscle is teased, put on a glass slide, and examined under the low power of the microscope.

The importance of diagnosing trichina infections is not limited to the scientific value of a correct diagnosis. Realizing, as we do nowadays, that parasitic diseases are much more common than was formerly considered, every effort should be made to study their modes of infection so as to limit their incidence. In trichinosis we are dealing with a process, the details of which are accurately understood: primarily a food infection

from uncooked pork, then a general blood infection, with final localization in the muscles—and it is not difficult to see that any successful combat with it must be prophylactic in nature. Whenever possible, every case should lead to a study of the source of infection, so that such a focus may be wiped out of existence.

THE SIGNIFICANCE OF FEHLING'S OR HAINES' TEST.

Graduates of many medical schools taking examinations for positions as internes are prone to say that the diagnosis of sugar in the urine rests on the reduction of copper sulphate; that a positive Fehling's, Haines,' or Benedict test means sugar. "Oh yes! other things reduce copper sulphate, but practically the test means sugar." The result of such an attitude is an erroneous diagnosis of diabetes, and the loss of many rare cases in which reducing bodies other than glucose are found in the urine. Broadly speaking, it is true that a copper reduction means sugar, and for practical purposes can be so interpreted; but from the standpoint of scientific accuracy it is far from true. Not only do many other sugars besides glucose reduce copper, but various other products of metabolism may occur in the urine and give the reaction. This is especially the truth when the reduction is "incomplete" or "atypical," and here a knowledge of the other possibilities may save a reputation or a patient. Men of large experience in urine analysis find many instances where a copper reduction reaction standing alone is insufficient for diagnostic purposes, and where a more complete study is necessary. Likewise in those clinics where a routine examination requires identification of all reducing bodies, the complete study often reveals some unusual form of metabolic disturbance of more than enough scientific interest to pay for the trouble of looking for it.

Our object in thus writing is to emphasize the point that, whenever possible, urines containing a reducing body should *at least once* be submitted to careful examination. Of course it is not always, or perhaps even often, possible for the physician to have polariscopic examinations and fermentation tests performed, although there is hardly a neighborhood which has not a laboratory capable of doing these tests. But the practitioner cannot be expected to go into these details, even though he realizes their importance. It is up to hospital laboratories to insist on a more rigid standard in urine work and to demand that "copper reduction" mean "copper reduction." In this way only can our hospitals add to the ever interesting literature on carbohydrate metabolism their share of studies on the rarer reducing bodies.

LITERARY NOTES.

It is not often that this column contains criticisms of novels, but when a novel is interpretative of certain social conditions, which are familiar to all observing physicians a further apology is unnecessary. "The Dangerous Age" by Karin Michaelis (John Lane Company, New York) is not written on conventional lines; if it were one could dismiss it with a few words. Nor is it exquisitely written in a tempo that would proclaim the authoress an artist in words. But it is a truthful book; truthful of the conditions of to-day which manifest themselves in that social unrest with which the medical world is not unacquainted. That the book is a medical document, such as a physician gifted with a literary grace would write, is not to the point, since we are sure the authoress lays no claim to this distinction; but that, in the words of Marcel Prevost, the distinguished French *littérateur,* "the book owes much to them [doctors] and to medical science" there can be no doubt. And this being the case it would be well for all physicians, whose readings are miscellaneous, to read this book if only to learn to what extent certain modern interpretations of hysteria have penetrated into the realm of belles-lettres. Whether or not we agree with the Danish authoress in all she says, we are not surprised at the wide success of her book—Germany and France have read nothing else in the last twelvemonth—for here we have mirrored chapters from our textbooks with the additional attractiveness of a literary touch that carries conviction with it.

In the "Biographical Reminiscences of Sir Samuel Wilks" (Adlard and Son, London) a new note in biography has been struck, and one that should give all aspiring biographers and autobiographers food for thought. In the majority of books belonging to this sort of picturesque writing, the magnification of the most humdrum incidents in the writer's life assumes such proportions that not only does a weariness possess the reader's mind, but the really good points which might otherwise have made a favorable impression are greatly observed. No doubt, Sir Samuel Wilkes had the usual mental and physical upsets peculiar to childhood, the morbid outlook on life at the immature age of sixteen, the frustrated ambitions to be a painter, a poet, a statesman; anything, in fact, but a doctor. But he does not bore us with these details in the least, since he considers them of no moment against the progress of scientific medicine as recorded in "Guy's Hospital Reports" from 1836 until 1886. That these "Reports" make interesting reading need not be emphasized here; for the mere mention of a tabulated method of impressing the reader with what was

momentous during those years should suffice to attract his attention. The romance of medicine has been written time and again, but, though the story told is entrancing enough, it fails to record the incipient gropings of investigators and experimenters in their pursuit to shed greater light upon what was but poorly understood. These faltering steps in the evolution of scientific medicine become important mile-stones when achievement can be recorded; and nothing, we take it, can be more important for the investigator of to-day than to realize the beginnings of every evolutionary chapter. But it must not be inferred from what has been said about this exceptional book, that a bare mention of the salient features of the "Reports" constitutes its worth and value; this would be doing the author an injustice and making light of the weight of his comments. And it is just by reason of his comments that the connecting links are supplied and a continuous story is unfolded and continuity is lent to the telling of what were really the medical hall-marks during half a century.

In his three short essays contained in his book "The Medical Expert and Other Papers" (Broadway Publishing Company, New York), Dr. Louis J. Rosenberg distinctly gives evidence of the gift of writing to the point; and in these days when there is so much for us to read the absence of prolixity is certainly a virtue. But though directness should come in for its meed of praise, when it is made a cult, as it surely is in this book, it has its drawbacks, for it soon deteriorates into an artificiality that is somewhat irritating to the reader. By this we do not wish to express the idea that these essays are not well worth reading, but rather our regret that such important subjects as the medical expert, professional secrecy, and the metabolism of morality should not have been more fully treated. Pithy sentences are very well when judiciously sprinkled throughout the text, no matter how weighty the subject, but when they are thrust upon us on every page the serious thought of the author is sadly crippled inasmuch as the constant holding of oneself in check plays havoc with the sort of discursiveness without which no writing is as effective as it should be. Despite what we conceive to be the defects of this slender volume, the several points brought out by the author are very good, indeed. Especially is this true with respect to the first essay, "The Medical Expert," in which the author dwells upon the advisability of "medical experts [being] called by the Court instead of by the counsel who has an interest in making the expert testimony aid his own side of the case."

ORIGINAL ARTICLES.

ACUTE POLIOMYELITIS: REMARKS ON THE DIAGNOSIS IN THE LIGHT OF RECENT STUDIES.

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Since the appearance of Ivar Wickham's monograph in 1905, on "The Pathologic Anatomy of Poliomyelitis," an admirable analysis of nine acute cases coming to autopsy in from three days to eight weeks after onset of symptoms, contributions to the study of this disease have been numerous, varied, and of incalculable importance. To intimate, however, that prior to this recent date poliomyelitis had been regarded with indifference or inexactness would be a subversion of the facts. For surely von Heine, as early as 1840, separated out the spinal from the cerebral form of infantile paralysis, and Medin* enriched our clinical data by his trenchant observations of the Stockholm epidemic in 1887. Next, the attention of such workers as Charcot, Goldscheider, Siemerling, Redlich, and Schultze was focused upon questions of pathogenesis and pathology, but the *close* scientific study of epidemics occurring in more or less rapid succession since 1902 is in far greater measure responsible for our revaluation of the clinical picture of acute poliomyelitis aided most materially by the accession of new and incontrovertible facts from the laboratories of research.

(From Wickman in "Handbuch der Neurologie" (Lewandowsky):—

Author.	Epidemic.	0-3 years.	3-6 years.	6-9 years.	9-12 years.	12-15 years.	15+ years.	Total.
Medin	Stockholm, 1887-1895	50	13	1	..	..	1	65
Wickman	Stockholm, 1899	34	12	1	1	..	5	53
Wickman	Goeteberg, 1903	11	5	2	..	..	2	20
Wickman	Sweden, 1905	183	214	179	123	106	220	1025
Collective Report	New York, 1907	463	197	40	21		8	729
Emerson	Massachusetts, 1908	29	13	10	3	5	9	69
Zappert	N. Austria, 1908	151	59	21	9	5	7	252
Lindner u. Mally	O. Austria, 1908	37	19	15	13	7	5	96
Fuerntratt	Austria and Steirmark, 1909	25	135	85	41	21	43	450
	Total							2759

*To perpetuate the memory of the service rendered by these two pioneer investigators, Wickman's endeavor to rename acute poliomyelitis the Heine-von Medin's disease is indeed commendable, but will, I fear, fail of universal adoption.

The epidemics of Hessen Nassau, Germany, and our own Minnesota and Iowa epidemics will bring the total down to date.

Indeed, I think it not amiss to add that medical chroniclers and text-book writers will do well soon to restate a large part of the matter descriptive of acute poliomyelitis. Already animal experimentation at the hands of Flexner and Lewis, Landsteiner and Levaditi, Rœmer, Mueller, Straus, and others has prepared the way for our better understanding of the spontaneous disease in man, towit: its communicability, the mode of infection, the nature of the virus, and its specificity for the central nervous system. Much is to be hoped for from the extension of this laboratory inquiry to problems touching on immunity, prophylaxis and in the last analysis control by specific treatment. Questions of scientific attainment and progress aside, this paper will cardinally concern itself with the clinical conception of the disease, which, thanks to the students in the field of epidemiology, has been very considerably broadened; in fact, so much so that clinicians seem to be touching hands with the research worker in erecting the hypothesis that after all poliomyelitis may properly prove to be but a generic term to designate a variety of more or less closely allied symptom-complexes arising from lesions of the cerebrospinal axis that have their origin in specific, yet distinguishable, microörganisms. As concerns the distinction between an epidemic and sporadic form, if criteria based on clinical and epidemiologic study suffice, they are in their nature and manifestations identical. In this paper reference to the one will unqualifiedly apply to the other.

If we revert to the older clinical writings, we come upon a description of poliomyelitis setting forth the well-known classic form, with its acute onset, flaccid leg paralysis, subsequent atrophy and terminal contractures. Occasionally we meet with more pointed comment than this. Recently acquired facts, however, should make obvious to the practicing physician the need of knowing more of clinical poliomyelitis than that it is a disease limited to the anterior horns, affecting only young children and characterized in the main by fever and a painless kind of paralysis. Indeed, many more considerations worthy of note qualify the general disease picture than this. To know that the paralysis singles out certain muscles or groups of muscles, that it is a flaccid paralysis, frankly asymmetrical in its distribution is not unimportant. Only in the severest cases is the entire limb withered and destroyed. It is well to remember that the affected muscles alone undergo atrophy; that the corresponding tendon reflexes are reduced or abolished, and that in the affected muscle and nerve supply the response to a faradic current is reduced or altogether lost. Moreover, in a general way, it is worth noting that every case is not ushered in with a stormy onset; on the contrary, that the invasion may be so mild and afebrile that the subsequent weakness or paralysis may be the very first clue to the presence of the disease. Finally, that paralyses affecting, for instance, the shoulder

girdle, are likely to occur in poliomyelitis, though less common than the leg and arm varieties. When these facts become more thoroughly appreciated, a correct early diagnosis will more often obtain. But this is not all.

Keeping abreast of advances, it has remained for Wickman (in emulation of Medin), Krause and Mueller to give us a new *grouping* of disease forms, based on predominant symptoms or such as stand in focal relation to anatomic levels in the brain and cord. The position of the leg type, with its lesion limited to the spinal gray of the cord, is not disturbed; it remains in the centre, a nucleus, as it were, around which are fashioned other types not as prominent, perhaps, but none the less important. Wickman's arrangement of the classical form of poliomyelitis are as follows:

I. The spinal poliomyelitic type.
II. The type of ascending or descending paralysis simulating Landry's paralysis.
III. The bulbar or pontine type.
IV. The encephalitic type.
V. The ataxic type.
VI. The polyneuritic type.
VII. The meningeal type.
VIII. Abortive types.

In so grouping the cases, there is no intent to confuse or becloud the practitioner. On the contrary, the mere fact of singling out this or that syndrome for its conspicuousness and exclusiveness, and giving it a characterization of its own should serve to bring the entire symptomatology into nearer and clearer view. Moreover, physicians who might hesitate in the diagnosis of atypical cases will perhaps be made to feel more certain of their premises when they bear this arrangement in mind.

I recall several cases seen within the past years so illustrative of an unusual onset and atypic course that they seem worthy of mention in slight detail.

Miss D. B., aged twelve; was seen in consultation with my colleague, Dr. Julius Hess, November 8th, 1910, and observed daily thereafter for many weeks at the Michael Reese Hospital, Chicago. A rather mild insidious onset for the first few days, characterized by some fever, malaise and restlessness, and, on the fourth day, by almost incessant vomiting. A servant in the same household, and a younger sister fell ill at the same time, and in a similar manner, but their symptoms rapidly disappeared by the fourth day, whereas our patient grew worse. Up to this time the acute gastro-intestinal invasion affecting three individuals simultaneously, suggested something of an innocent ptomaine-like disturbance. Our patient now developed a temperature of 101° to 102° F., became very restless, sleepless, excitable and had occasional vomiting spells. On the eighth day, when I first saw her, she, for the first time, showed difficulty in swallowing, and the voice sounds were husky and of nasal quality. The head lay in a limp position to one side, and when turned or raised voluntarily brought on a fit of coughing or choking. Attempts to take food or water

resulted in paroxysms of strangulation most distressing to witness. The face was flushed, the eyes bright, the pupils well dilated, reacting normally to light and accommodation, and the fundi were negative. Respirations were notably rapid and shallow. Examination revealed a slight drooping of the right corner of the mouth, complete paralysis of the soft palate on the right side, and a relaxed uvula. Other cranial nerves were apparently intact. This clinical picture remained unchanged for another day or two. The extremities were freely moved. Bowels and bladder were continent. Within a day or two pain appeared at the nape of the neck, in the small of the back and in the legs. The head could not be lifted, the arms and legs remained free. After another twenty-four hours the picture changed in that the legs were involved in a rapidly descending paralysis, affecting all parts symmetrically except the toes, which never quite lost all their ability to move. The back muscles as well as intercostals were impaired. The abdominal recti were spared. The arms from beginning to end were unaffected. Sphincter control was for a time lost, then regained. The facial and glosso-pharyngeal paralysis so predominant at first began to improve some late in the second week. Nasal tube feeding was discontinued after the eleventh day, but solid food was taken with great caution for many weeks later, and it required several months before normal swallowing took place. As the bulbar symptoms receded, the spinal ones, showing only in the legs, deepened. The tendon reflexes in the arms were present; the abdominal skin reflexes also faintly so; the knee-jerks and Achilles were absent (and have remained so); the plantars were present. The spinal syndrome was for many weeks characterized by intense agonizing pains in the lumbosacral region, radiating into the legs; indeed, so severe as to require constant changing of body position, hot flannels and morphine. Objective sensory disturbances there were none. The temperature was for the most part of low grade, ranging from 98° to 100°, never exceeding 101.2° F. Respirations, irrespective of the temperature curve, varied mostly from 36 to 48, never falling below 28. The reaction to degeneration taken on the twelfth day was complete for some muscles, incomplete for others. The urine showed some casts and desquamative renal elements. The blood showed 4,200,000 reds; whites, 16,600, and hemoglobin of 90. Spinal puncture revealed a perfectly clear fluid, 6 to 10 lymphocytes to a field, no other cellular elements. Cultures from the spinal fluid were negative. Tubercle bacilli not found. Noguchi negative. Eleven months after date of onset, the residuum of paralysis is now confined entirely to the limbs, which have undergone considerable selective atrophy, the voice retains the least degree of nasal quality, the functional ability of the legs is restricted to only momentary support when unaided in standing.

This case probably does not fall into the rubric of those pure bulbar or pontine forms in which symptoms of a focal character for this region alone occur. It ranges itself more with the commoner forms in which the spinal and cranial nerve components occur together, but with the one or other predominant. Isolated bulbar and pontine forms, however, do occur, and in this connection I beg leave to roughly sketch the clinical findings in a case seen only a few days ago, in the pediatric service at the Michael Reese Hospital, also with Dr. Julius Hess.

Patient, R. G., aged three years, was taken ill four days before admission to the hospital, with three vomiting spells occurring at night, some frontal headache, rather persistent, and the following morning slight temperature, with irritability and later apathy. The family history good, although one sister is

known to have tubercular hip disease. A child, living only four doors removed, is known to have come down with paralysis at the same time that our patient fell ill. One day prior to admission the parents noticed an internal squint of the left eye. On admission the temperature was 101.6° F., pulse 120; respirations 32. This curve dropped to normal after the first day and has remained so. Physical examination revealed on the part of the cranial nerves a distinct left external rectus palsy; pupils and fundi were negative; well-defined left facial palsy of peripheral type; deviation of the tongue to the left (not apparent, but real). On the first day there was definite rigidity of the neck muscles, so that attempts to lift the head caused the shoulders to rise. Palpation of the neck muscles was painful. Anticipating some ear involvement because of a slight complaint of earache, paracentesis was done, with negative result. The mastoid was not tender. After the first day, the sense of rigidity of the neck muscles disappeared and, judging from the position of the head and the readiness with which it falls backward, the posterior neck muscles now show definite weakness. The child's gait was closely observed. There was no gross paralysis in any one muscle or group of muscles, but conspicuous were the queer, infirm, uncertain ataxic steps of the child. Although an unusually intelligent child for her age, she could not assist enough for the determination of slight errors in motility or strength. The reflexes in the upper extremity were present; abdominal skin reflexes present; painstaking effort failed to elicit the knee jerks; the Babinski was absent; the plantars were present. The urine was normal. The blood count showed only an increase in the white cells 14,400. The Pirquet negative; the spinal fluid which was not under tension was perfectly clear and sterile. The Ross Jones and Noguchi tests were negative; very few lymphocytes were noted. On the whole, the child's condition was rapidly improving.

Conceding the possibility of a basilar or pontine lesion of different pathology I feel very certain of the poliomyelitic nature of the infection in this case, on the strength of the pontine symptoms, involvement of the sixth, seventh and twelfth nerves, the paretic neck muscles, the ataxic gait, together with the lost knee jerks. The ataxia, which in this case bore the closest resemblance to a cerebellar ataxia, has already received mention by Wickman, Zappert, and Spieler. Wickman cites an instance of oculoplegia, left facial and right hypoglossal paralysis, with ataxia of a cerebellar type. Mueller has reported a similar case, having much in common with ours, presenting facial paralysis, notable hypotonia and absence of the knee jerk on one side. Of the cranial nerves, the seventh is most frequently affected, involving both its upper and lower branches. It is usually unilateral and shows a tendency to improve, so that the ultimate disability may be very slight indeed. Wickman calls attention to the association of hypoglossus palsy in these bulbar and pontine types, where the facial is affected, and remarks also that on the part of the ocular nerves the third (oculomotor), and the sixth (abducens) are not infrequently involved. In some instances complete ophthalmoplegia has been observed; in others an isolated ptosis occurs. Optic atrophy was noted by Tedeschi in a case of poliomyelitis that had run its course, and Medin, Wickman and others have seen trigeminal disturbance with paralysis of the mandibular muscles.

I have sought to show by these brief case histories and references to the literature that cranial nerve lesions, with or without spinal involvement, characterize many of the atypical forms of poliomyelitis. I feel that the physician should bear these points in mind, and to this end Wickman's tabulation is subjoined as further evidence of their frequency-incidence:

EPIDEMIC OF 1905. (Wickman.)

Cranial +	Spinal Lesion.	Cranial Alone.
VII	12	14
XII	9	9
Eyes	5	3
VI	4	2
III	4	2
IX-XI	5	4
V	2	..
II	1	..
	42	34

1. Mueller, in 100 cases, saw 13 facial and 3 external rectus palsies.
2. Zappert, in 290 cases, 25 cranial nerve lesions.
3. New York epidemic report. Among the 752 cases, face affected in 27, eyelids in 18, strabismus in 26, deglutition in 18, speech anomalies in 28.

Meningeal Types.—An atypical form of poliomyelitis, which chiefly from its mode of onset, gives rise to confusion and leads to hesitancy in rendering a diagnosis is the meningeal form. Within the past five years I have seen some five instructive instances of this sort. One such case was seen in the neuriatric service at Wesley Hospital, occurring in an electrical engineer, aged 21. Three were seen among children in private practice, whose respective ages were one and one-half, three and four years, and the fifth occurred in an infant less than one year old, seen with my colleague, Dr. I. A. Abt, in his pediatric service in the Michael Reese Hospital. Knowing from a study of the pathology that the brain cortex and meninges are not always exempt from the vascular irritation, cellular infiltration and edema characteristic of poliomyelitis, occurrence of meningeal symptoms is in a fair per centage of the cases to be anticipated. In fact, the disease is not infrequently ushered in under the guise of an acute meningitis more closely simulating the cerebro-spinal form than any other, with intense headache, photophobia, vomiting, neck rigidity, posterior neck and head pains, opisthotonos, convulsions and stupor. Following this stormy onset, the paralytic symptoms generally appear. Some observers, however, are confident that in not a few instances the meningeal syndrome clears up without paralysis superadded, and then again death may set in early, before the paralysis has had a chance to appear. In respect to this particular form, the New York epidemic offers striking data which, by the collective investigation committee, were classified with the nervous symptoms so-called. Headache occurred in 162 cases; delirium in 62; convulsions in 51; twitchings in 8; apathy in 294; stupor in 71; neck rigidity a marked factor in 121 cases,

and photophobia in 26. The comment is that "these might well be placed in Wickman's category of the meningeal type."

The young engineer referred to is a classic case in point. He presented for the first four days a temperature of 103° F.; agonizing headache; photophobia; delirium; marked neck rigidity; severe back pains; opisthotonos; generalized muscular twitching; bilateral strong Kernig; vomiting, and a quadriplegia associated with marked widespread dysasthesia and some spasticity. The withdrawal of spinal fluid on the third day revealed a perfectly clear content, which, when centrifuged, showed numerous lymphocytes. This operation reduced much of the patient's restlessness and headache. On the sixth day the paralysis came to the fore, at first involving all four extremities, and gradually receding to the point of a permanent, severely disabling triplegia. Here the negative qualities of the spinal fluid were of the greatest value in arriving at the differential diagnosis of true meningococcic origin.

Abortive Types.—The designation "abortive" applies to those cases of poliomyelitis that appear concurrently with the more classic paralytic types, but manifest practically only the symptoms of the general infection; in other words, a case characterized by invasion symptoms without paralysis occurring at a time when a neighborhood or epidemic infection with paralysis is known to exist, would constitute an example of the abortive form of the disease. I believe this form is seldom apprehended in sporadic poliomyelitis, but I rather suspect that the younger sister and domestic living in the house of our first patient, sickening at the same time and in the same way, aborted their attacks of poliomyelitis in or through their gastro-intestinal tracts. The history of epidemics is replete with such instances in which nausea, vomiting and diarrhea appear, and suggest a violent gastro-enteric catarrh. Wickman, here, as everywhere in his clinical revision, seeks to clarify these types by assuming the following scheme:—

1. Cases running the course of a general infection.
2. Cases with symptoms of meningeal irritation resembling "meningismus."
3. Cases in which the element of hyperesthesia and pain is marked (pseudo-influenzal).
4. Cases with gastro-intestinal disturbance.

These sub-varieties fuse with one another, but it is well, on the whole, to recognize their larval character. The practitioner who will instinctively call these abortive types to mind when confronted with a patient will find the problem less difficult.

The polyneuritic form distinguishes itself by reason of the appearance of greater pain and tenderness in the muscles and nerve trunks, pain in excess of the generalized dysasthesia which may be present. An analysis of the early stages will show that some degree of pain and general hypersensitiveness, usually of short duration, is a not uncommon finding

in poliomyelitis. There is no post-mortem evidence to show that neuritic changes take place in the large nerve trunks in this particular type. The pain element, then, taken at its proper value, is polyneuritic-like and not actually neuritic in the sense of showing neuritic pathology.

Because of its value in the differential diagnosis, especially as it relates to cerebro-spinal meningitis, a word concerning the spinal fluid is indicated. In the majority of cases during the initial stage, and even for weeks after onset, the fluid will be found increased, released under pressure, perfectly clear and absolutely sterile. As to the cell content in the centrifuged specimen, authorities differ somewhat. Müeller found only a few lymphocytes and confirmed Krause's findings of the previous year's epidemic in Germany. Wollstein, from an examination of twenty cases, developed from the second day to eight weeks among children from five months to eight years of age, found the fluid always colorless and clear, and in most of the centrifuged specimens stained with methylene blue and by Gram an entire absence of cellular elements. On the other hand, we have some reports from some French sources (Brissaud and Londe, Triboulet and Lippman), Starr and others that the lymphocytes are increased. The diplococci occasionally described are probably accidental findings, due to error in technic or mixed infection. This negative character of the fluid is in such marked contrast to the cerebro-spinal fluid of meningitis of whatsoever origin, but chiefly the epidemic cerebro-spinal form, as to be of distinct value in differentiating these diseases in their acute stage, for here we find turbidity, leucocytosis and the meningococcus intracellularis. In differentiating from the tubercular meningitis we may, by reason of the clearness of fluid and lymphocytosis in both, encounter greater difficulty, but the tubercle bacillus is with proper staining and patient search now being found in nearly all cases.

Without doubt the differential diagnosis between multiple neuritis and poliomyelitis, when both are well established, may give rise to the greatest amount of error; in fact, in some cases the positive diagnosis must be deferred until the period of convalescence and cure comes to our assistance. This applies with particular force to the post-infectious neuritides. I recall R. B., a female patient, eight years old, seen in the pediatric service of the Michael Reese Hospital, at the request of my colleague, Dr. Abt, in whom the question of a post-diphtheritic neuritis or poliomyelitis remained speculative for many weeks, almost until she was finally dismissed from the ward as cured. It should be remembered that an angina, bulbar and spinal symptoms occur in both diseases.

To dwell upon the syphilitic affections of the cord, syringomyelia or progressive muscular atrophy in their differential relations to acute poliomyelitis, would take me quite beyond the reasonable latitude to be observed in a paper of this kind.

31 North State Street.

THE TREATMENT OF GRIP.

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Of grip or influenza there are two statements to be made which I think no one will attempt to gainsay; first, that of all the acute infectious diseases with which we have to deal, it is the most common; secondly, that no other acute infectious disease is so protean in its manifestations as this ubiquitous malady.

Much confusion has arisen in the use of these two terms, grip and influenza. By most men they are used synonomously, but many insist that influenza is applicable only to that infection caused by the organism of Pfeiffer, the influenza bacillus. If their contention is sustained, then we see this disease relatively infrequently, and what we consider as such and treat as such should receive another appellation and "grip" might be so used. Now, we do have a common clinical entity, characterized by suddenness of onset, aching pains in the back and limbs, headache, high fever, prostration, some catarrhal symptoms in the respiratory tract and followed by weakness and depression out of proportion to the other symptoms and which may be accompanied or followed by serious involvement of important organs or systems. These attacks are accompanied by the presence of one or the other or of a combination of several organisms, in such numbers and so distributed as to warrant the supposition that they stand in causal relationship to the disease; and among these organisms is the bacillus of Pfeiffer, but in by no means the majority of the cases. Beside this organism may be found the pneumococcus, the streptococcus pyogenes, the streptococcus mucosus capsulatus or the micrococcus catarrhalis. In no way does the attack, with reference to the onset, characteristic pains and aches, prostration, after effects or complications, differ in one case or another sufficiently to guarantee a diagnosis of the organism concerned. Moreover, the influenza bacillus has been found in other conditions that do not present the clinical picture of grip. Whether we are dealing with one or the other bacterium can be determined only by culture. At the present we have no specific treatment for influenza and find ourselves limited to the effort to afford relief, to prevent complications, or treat them if they do occur.

All that follows, then, is applicable to the clinical grip and if I use both terms, it will be understood that they are used synonymously.

An attack of grip of average severity compels a patient to seek rest and seek it in bed; but in lesser attacks, often termed common colds—

and, indeed, the border line between the common cold and grip is by no means clear cut—the patient may insist on keeping about and endeavor to attend to his business. That every patient with a cold in the head should go to bed is absurd, but if the so-called cold is accompanied by signs of intoxication, aches, pains, prostration and temperature out of proportion to the local manifestations, then the diagnosis is warranted, as at least connoting a more serious infection, of which the complications or sequelæ are to be feared, and the patient should be ordered to bed until his temperature is normal, his protests being met by a presentation of the facts and possibilities in the case.

The typical attack of influenza is usually abrupt, sometimes like a bolt out of the blue, ushered in with chilly sensations and decided malaise.

The patient should be put to bed, a hot water bag put at his feet, a drink of hot tea, hot water and a teaspoonful or two of whiskey or a hot lemonade with or without whiskey given, and blankets added to the covering until the febrile reaction begins. With the fever comes the headache, the pains in the back, and bones that makes the patient feel as if he had been mauled and bruised and the discomforts of the elevated temperature. The head is often confused and a mild delirium may occur.

A cool sponge bath or one with tepid water or one containing a little alcohol applied to the whole body or to the face, arms and legs gives some relief. Cold cloths are placed on the forehead to relieve the headache or an ice-bag may be used. Bits of cracked ice are sucked or small amounts of cold water taken frequently.

A saline cathartic should be given, in the shape of a Seidlitz powder, a full glass of liquor magnesii citratis, or a half ounce of either Rochelle salts or Epsom salts in a half to three-fourths of a glass of water.

Diet.—At the onset of the attack food should not be offered; and the anorexia should be taken as an indication that the body is not ready to entertain it. After the first day, however, fluids in the shape of milk or gruels may be given and later soups, eggs, and cereals.

When the temperature has subsided the diet should be made liberal, for the loss of flesh may have been considerable, and it must be appreciated that the 2,500 or more calories that the body will have, even in the weakened state, must come from somewhere, out of its own tissue, if not provided for in its food.

In no other acute infectious disorder do the coal tars work so happily to the comfort of the patient, as in this.

The sudden fever, the severe headache and the racking pains of body and limbs all indicate these antipyretics and analgesics.

There is no class of drugs more abused or misused than the antipyretics. In a certain number of conditions when properly used they are invaluable, but like most drugs of real worth they are rife with danger when administered carelessly or in ignorance.

The three best known antipyretics are acetanilide, sometimes called antifebrin, antipyrin, and phenacetin.

This is also the order of their potency and of their toxicity. From these three have come numerous derivatives, made by introducing a radicle into their structure or substituting one radicle for another, in the effort to enhance their pharmacological value and at the same time diminish their dangers. With them have been combined other drugs of a different pharmacological action in the effort to get the two in one preparation, as for example when antipyrin and chloral are combined to form hypnal to get a substance which will produce sleep in the presence of pain, or salicylic acid and antipyrin are combined to form salipyrin to enhance the value of salicylic acid in the relief of pain in rheumatism.

So quickly and abundantly have these preparations come, so ardently have they been welcomed and praised, so rapidly have they been abandoned that it is difficult to set an appreciation on more than a few of the group.

Personally, I rarely use for any purpose any other than the three first mentioned.

In grip any one may be used; better results are obtained from small doses frequently given than from large doses. Which of these is the better I cannot say, but one will find oneself giving preference to one or the other more and more and that will represent the fact that the workman is becoming used to his tool.

In grip my preference is for the most toxic and potent of these three —namely, acetanilide, but I give it in small quantities at frequent intervals.

The results have been so good, year in year out, that I have felt no inclination to experiment with the others.

I have no doubt that I should have had just as good reports to offer from one of the other preparations had I accustomed myself to their usage. My favorite prescription runs thus:—

℞ Acetanilidi. 1.50
Sodii bicarbonatis. 1.00
Caffeinæ citratæ. 50
M. et Divide in capsulas no. xv.

Each of these capsules, then, contains 1½ grain of acetanilide, which is a very small dose, one grain of bicarbonate of soda, which possibly lessens the slight irritant effect of acetanilide on the gastric or mucous membrane; at any rate it is given on that supposition, and ½ grain of citrated caffeine, for two reasons: First, as a prophylactic, to counteract the slight depressing effect that is induced in some susceptible individuals by acetanilide, and secondly, because it is itself an analgesic.

The fact that caffeine is a circulatory stimulant naturally led to the supposition that its presence in a prescription containing acetanilide or other antipyretic afforded an antidote in some measure to the toxic effects of the latter. Physicians have been influenced by this idea to permit patients to take doses of these antipyretics, when so "sheltered," of a size they would fear to administer, if given alone.

Worth Hale* experimenting on the toxicity of acetanilide when administered alone, when given with caffeine, with sodium bicarbonate or when all three are combined, obtained results that make us pause in the use of the larger doses of these drugs.

In animals he could show that the addition of caffeine to acetanilide caused death by the latter more quickly or in smaller dose, while bicarbonate lessened the toxicity of acetanilide.

In white mice he found acetanilide and sodium bicarbonate the least poisonous, acetanilide alone next, acetanilide, caffeine, and sodium bicarbonate still more, and acetanilide and caffeine most.

I give this capsule, if the attack is severe, every hour for four doses, then every two hours, so that, the patient gets only 10 grains in ten hours, a dose set down in some of the books as a single dose, though I think it rather large.

In the vast majority of cases the effects are very manifest in terms of relief from discomfort within a very few doses and this is followed soon by a fall in temperature, which is usually marked by, if not before, the next morning.

If such relief occurs, one may give the capsule the next day at three-hour intervals and the next at four-hour intervals. In the lighter attacks the drug need not be continued beyond the next day. If the attack is prolonged or complications ensue, the drug should not be too long continued. Such continued usage will do harm. Its benefit is confined to the early, sthenic period of the infection.

This is very important to remember, for one must not entertain the idea for a moment that these drugs cure the disease or have any direct action on the invading organism. They simply make the patient more comfortable and in better condition to meet the infection.

The effects of these drugs on fever is rather interesting, and, indeed, we need once in a while to orientate ourselves with reference to our ideas of fever.

Fever, after all, is a state or condition in which the bodily processes operate at a higher bodily temperature. This state may be variously brought about; but here, as in most of the fevers in which we are interested, it is brought about by the action of the toxins of the infecting organisms on the heat regulating mechanism. We often speak of the patient as "burning up with fever" and entertain the idea that his combustion, his oxidation processes, are greatly increased.

This is not the case. The actual increase in oxidation is slight. While varying in different diseases and individuals, the amount of increase will not average over 25 per cent. of the heat production at rest and as compared with the output of heat during active exercise is a mere bagatelle.

A man at rest with food eliminated 812 grams of CO_2 in the day and

*Worth Hale: The Effects of Caffeine and Sodium Bicarbonate Upon the Toxicity of Acetanilide. *The Journal of Pharmacology and Experimental Therapeutics*, Vol. I, No. 2.

a man at severe work 3,073 grams of CO_2: over three and a half times as much, and yet all the heat this oxidation represents induced no fever.

Nor, on the other hand, is the output of heat greatly interfered with to account for fever.

What seems actually to occur is that the heat regulation has been set at a higher level, runs on a different plane.

But on this plane the same mechanism for retaining heat when the body temperature is lowered and the same mechanism for getting rid of heat when the body temperature is raised is called into action as when running at a normal level. At this new level, however, the mechanism is not so nicely adjusted and greater variations follow from lesser influences exerted on it; hence, the marked effect of antipyretics in fever that we do not see follow in conditions of health.

This regulating mechanism is vested in special nerve-tissue somewhere at the base of the cerebrum, in the neighborhood of the corpus striatum.

How antipyretics act on this centre we do not know, but what is does is to knock the regulation down to a lower level, on which the mechanisms of defence against an increase or decrease of heat are called into action, just as on the higher plane before the administration of the drug and as on the lower plane in health.

But as the influence of the drug wears off or the influence of the toxin reasserts itself, the heat regulation is pitched higher and higher to its old level.

We know that the fever is not the disease, only a symptom.

We know that temperature above 102° F. is accompanied by increased proteid destruction, which it may or may not be desirable to interfere with.

We know that the temperature may become so high as to threaten life itself and then certainly should be combated; but we are coming more and more to scrutinize symptoms so as to detect in them expressions of compensatory processes.

That fever was a favorable state in the presence of the toxemia of infection was an idea long entertained, more lately fell into disrepute and, now, most recently, is being advocated by thoughtful men and careful observers.

What our antipyretics do of value in grip is probably less attributable to the lowering of temperature than to the relief of aches, pains, cerebral excitement, all of which mean wear and tear, and so, as I have said, make the patient better able to cope with the infection.

Acetanilide is chemically a very simple body.

It is derived from anilin, $C_6H_5NH_2$. It was discovered that anilin had the property of lowering temperature but that it was at the same time very toxic, inducing collapse.

I have shown how the toxicity of a drug may be altered by the introduction of simple radicles into its constitution without altering its effi-

ciency from a therapeutic standpoint, when discussing the salicylates in the treatment of rheumatism.*

Now the introduction of an alkyl radicle to replace an H of an amido group retards the action of the base, so when the acetic acid radicle CH_3CO- takes the place of an H in the amido group of analin C_6H_5NH (CH_3CO), it retards the action of the active portion of the molecule which is analin, set free, and it does that by offering resistance to the oxidative processes of the organism, by which the setting free of the analin occurs. The result is a partial detoxication of the anilin. When the anilin is set free the body further oxidizes it to a paramidophenol, which is anilin with a OH radical taking the place of the H in the ring opposite the NH_2 group, the para position. This oxidation further detoxicates the substance and when finally it becomes paired with sulphuric acid or glycuronic acid the detoxication is complete and the substance is so eliminated in the urine.

CNH_2 HC—CH HC—CH C H	H $CNCH_3CO$ HC—CH HC—CH C H	CNH_2 HC—CH HC—CH C OH	$CNCH_3CO$ HC—CH HC—CH C OC_2H_5
1	2	3	4

1. Aniline.
2. Acetanilide, in which one of the H molecules in the amido group has been replaced by the alkyl radicle CH_3CO.
3. Paramidophenol, in which an H molecule in the opposite group (paraposition) has been replaced by an OH radicle.
4. Phenacetin, in which the H molecule of the paraposition of acetanilide has been replaced by an oxyethyl group O_2CH_3.

When the chemists appreciated the means by which Nature detoxicated acetanilide, they seized on the paramidophenol, which while less poisonous than anilin was still capable of inducing symptoms in kind and of still changing hemoglobin into methaemoglobin like the mother substance and rendered it less toxic by introducing an ethyl radicle into the OH in the para position and thus produced a body which permitted the paramidophenol to be set free from its molecule still more slowly and therefore was less toxic. The characteristic action, being all the time due to the paramidophenol.

This body is known as phenacetin $C_{10}H_{13}NO_2$. One sees then that phenacetin is acetanilide in which the H. of the para position is replaced by an oxyethyl group.

So it is with all this group of drugs. They all owe their activity to the setting free of the paramidophenol, but their efficiency and safety to a nicety of balance between "fast enough" to have action on the tissue and "slow enough" not to poison the tissue.

*See Treatment of Rheumatic Fever, *American Journal of Medical Sciences*, March, 1910.

So in administering these drugs, the amounts and frequencies with which they are administered make a great difference in the ultimate results.

If one entertains prejudices against acetanilide, one may use the less toxic phenacetin in its place in such a prescription as I have just given in doses of gr. ii to ii ss; or it may be used alone, as the use of the other constituents in this case obtain to a less degree.

If these antipyretics be used injudiciously in large amounts or in cases of idiosyncrasy for the drug, certain untoward results may ensue. They are the onset of (1) collapse, (2) cyanosis, (3) a group of lesser disorders.

(1) The collapse may come on abruptly or after certain premonitory symptoms. It is more likely to ensue with acetanilide than with the others and with antipyrin more commonly than with phenacetin.

The patient is pale, the skin cold and clammy, the pulse rapid, small and sometimes irregular, the pupils slightly dilated and the patient faint, apathetic or confused. He may remain, however, perfectly conscious. The treatment like that of collapse from any cause is, in brief, application of heat and stimulation.

(2) Cyanosis. A marked degree of cyanosis is a characteristic symptom of poisoning by these drugs and is most marked after acetanilide, less after phenacetin and least after antipyrin.

It occurs early relative to the more dangerous symptoms and it is not an uncommon experience to see patients who use this class of drugs freely for headache and neuralgias, especially in the shape of some of the proprietary remedies, with blue lips and finger nails, though not conscious of further distress.

The cyanosis is not an indication of respiratory or circulatory embarrassment, but is due to changes in the coloring matter of the blood, to the formation of methemoglobin. Of course, if the dose is sufficiently large, dyspnea and cardiac failure ensue.

(3) Among the lesser disorders that occasionally appear are eruptions, erythemata, urticaria, or even angioneurotic edema. There may be burning of throat or mouth, nausea or vomiting, excessive perspiration, more rarely apathy or mental confusion or disturbances of hearing.

The eruptions may give rise to a diagnosis of scarlet fever or measles. In the former case the sudden onset and other symptoms may easily be diagnosed as grip and the coal tars given in treatment.

With the appearance of the eruption one might attribute it to the coal tars. Take no chances in the matter. Treat it as scarlet fever until proven to the contrary. When one has to differentiate between two conditions, one of which is common, and the other unusual, one should always give preference to the former. One should not let the possibility of a shrewd diagnosis run away with sober sense.

By enumerating all the things that may occur after the use of the coal

tars, I do not wish it inferred that they are common. They are really safe drugs to use, when used properly. More can not be said of any drug.

As has been said, there are no end of drugs advised for grip. When there is no specific for a disease, one is impressed with this or that line of treatment in proportion to his knowledge of the man who advocates it and the terms in which he estimates it.

Burney Yeo, whose position as a clinician needs no comment, in his "Manual of Medical Treatment," is so thoroughly convinced from his personal experience of the efficacy of quinine after two or three days preliminary treatment with such measures as I have described, his own preference being salicin, that I cannot refrain from mentioning it though I have had no personal experience.

He uses it in doses of gr. i to iii every three or four hours and prefers to give it in solution in citric acid; lemon juice would answer.

Certainly the doses are neither large nor frequent; the effect of quinine upon temperature and pain and to lessen metabolism and its freedom from bad effects are well known and would lead to no hesitation in its usage.

Some involvement of the upper air passages or of the trachea is almost constant. In most cases it is slight and relief is afforded by local measures or by inhalations. Tracheitis is not uncommon, causing a nagging cough, and a feeling of rawness or discomfort under the sternum.

I am fond of a simple remedy that works admirably in many instances. A mixture of equal parts of spirits of turpentine, spirits of camphor and olive oil is made, a bit of flannel to cover the anterior chest is saturated with it and laid upon the chest, pinned into the night shirt and left on for the night. This may be made in the house. Order a tablespoonful of each, stir with the spoon and saturate the cloth. The patients inhale the fumes all night and marked relief to the feeling of soreness and tightness is afforded, the cough ameliorated and expectoration facilitated. Camphorated oil may be used in the same way.

Inhalations of compound tincture of benzoin, or of the oil of pine, a teaspoonful or two on a pitcher of hot water, or a teaspoonful to a pint in an inhaler, or a few drops of the saturated alcoholic solution of menthol on a pitcher of water will prove grateful.

If the cough is more harassing, codeine may be used in doses of gr. ⅛ to ¼ every two, three or four hours, or heroin in doses of gr. 1/10 to 1/12 at the same intervals.

One of the most striking characteristics of this disease is the weakness and prostration of the patient after even a short course. In many, complications of a mental nature bespeak the profound effect of the poisons on the nerve centres.

Convalescence should not be hurried. Exposure after the attack has subsided, although a matter of two or three days is an invitation to relapse or complication. The danger must be explained to the patient and

the demands of his body for further rest, as dictated by his weakness, be listened to rather than his mental protests and ambitions and business urgencies.

If the patient will assume this attitude towards himself, his returning strength will give the word for further indulgence.

In the meantime the diet should be made liberal to make good the ravages of the toxins.

Simple well-cooked foods, solid or fluid are indicated. Light rubs or massage given to the sore and tired muscles, fresh air and plenty of it, in bed or chair at first and later in the walks and, if the convalescence is unduly protracted, a change of air does wonders.

Patients should not get back to work until they feel again the impulse of health.

At this juncture tonics are supposed to be indicated. I believe one should feel that the best tonics are to be found in fresh air, sunlight, good food and properly proportioned rest and exercise rather than in drugs.

If our patients however, are not content, after such measures have been honestly adopted, we may try strychnine in doses of gr. 1/40 to 1/30 three or four times a day.

Such is the treatment of a moderately severe attack of grip without complications; but it is the complications that makes grip the serious disease it is.

I have said that it is one of the most protean of diseases we have to deal with.

What organ may be implicated we do not know, but there are a certain number so frequently involved that we should never cease to keep our eyes open for the first indications of such an occurrence.

The respiratory tract in some part of its extent is almost certain to be implicated.

We have just dwelt on the lesser manifestations of it. Dependent on infection of the upper air tract is the common occurrence of otitis media.

I cannot dwell on all the phases of this important chapter of grip. What I want to emphasize is the vital importance of ever keeping it in mind.

In older patients the involvement of the ear is accompanied by pain, so that it is not likely to be overlooked, but in children and especially in younger children this does not hold true. It is the most common experience of a pediatrist to find the first evidence of an otitis in the discharge that has taken place through the ruptured drum.

In the acute infectious diseases of childhood it is good practice to examine the ears periodically and in such diseases as scarlet fever and influenza its neglect is scarcely pardonable.

Examination of the child's ear is not the easiest procedure in the world and so is commonly neglected by the general practitioner, but routine use brings its reward in facility acquired.

When treating a young child or infant for influenza, suspect the ear if there is sudden exacerbation of temperature, often very high in children, or if there is a rise of temperature after the normal has been reached, or the child becomes much sicker without obvious cause for the manifestations.

The temperature of otitis in children may be long continued and sometimes with marked excursions of temperature.

Let me intercalate here that when I see long continued temperature in children with marked daily excursions, I always think of influenza, otitis media or Bacillus-coli infection and of course, in a malarial district, of malaria.

The incidence of otitis seems to vary from epidemic to epidemic and its virulency too.

That mastoiditis is all too frequent a sequel, that sinus thrombosis and meningitis may be, that some of the cases are fulminating should make us appreciate the seriousness of it, and seek special advice.

If this is not at hand a paracentesis or incision is simple and should not wait on temporary measures of relief.

Another result of infection of the respiratory tract, much dreaded and constantly to be watched for is pneumonia. Influenza pneumonia has a high mortality, which differs in different epidemics.

While lobar pneumonia may occur with grip and run a regular course, the typical pneumonia is of the lobular type, bronchopneumonia.

As a rule this occurs a few days after the onset though it may be earlier.

Grip pneumonia is prone to be insidious. It occurs in scattered foci; it is often incomplete, its physical signs are very irregular, the subjective symptoms are out of all proportion to the objective.

It is frequently slow in resolution.

It is because of all these facts that the lungs should be examined daily. In two classes of patients the search should be especially assiduous; in old people and in children.

In old people the signs of bronchopneumonia are the least satisfactory. They may be absent entirely and the diagnosis be made on the degree of respiratory embarrassment and intoxication. The cough may or may not be prominent. The temperature may not be elevated.

The signs may be only those of localized bronchitis; that is, râles, or there may be only a little dullness and diminished breathing. One cannot watch the chests of old people confined to bed too closely. They are extremely susceptible to pneumonic processes, made much more so in a grip attack.

In children, too, it must be remembered that the physical signs are often slight and that the diagnosis may have to be made on the rapidity of respiration, prostration or cough.

The regularity of distribution of the lesion the incompleteness of the

consolidation and the persistency of signs may give rise to the diagnosis of tuberculosis. Such a case in a young man, with consolidation at the left apex, a fairly high temperature with a good deal of excursion, a severe cough and a prolonged course I saw diagnosed as a case of acute miliary tuberculosis to the great distress and alarm of the family, in which tuberculosis had occurred.

Again, the retardation in resolution of these patchy and incomplete consolidations may occasion the same diagnosis.

When these cases are determined, they should be treated as pneumonia arising from other causes.*

Tonsilitis, bronchitis and pleurisy are to be treated in the same manner as if arising under other conditions.

Of rhinitis I would add a word.

This is exceedingly common in influenza. It is often very distressing and accompanied by much frontal headache.

This usually means an involvement of the sinuses.

When the frontal sinuses are involved there is pain especially over the inner third of the orbital ridge and this pain is made worse by blowing the nose; when the ethmoidal sinuses are involved the pain is said to be deeper set or even occipital; when the antrum is involved there is pain in the superior maxillary, especially in the malar region and often a toothache on the affected side. Our efforts should be to endeavor to shrink the mucous membranes enough to open the ducts and passages to these sinuses to allow a drain. This may be done by spraying the mucous membrane with adrenalin 1 to 10,000 and after the drug has exerted its effect spray with an oily solution. I like one advised by Coakley—namely:—

℞ Menthol.....gr. xxx
Camphor.....gr. xx
Eucalyptol.....m. xx
Olei rosæ.....m. iii
Benzoinol, q. s. ad.....oz. ii
M. et S. Use in an oil atomizer.

If the antrum is involved, the head should be turned to the sound side, hanging a little over the edge of a pillow to facilitate the discharge.

The menthol solution as so given I find at times too strong. It may be reduced x or xv grains, or the whole may be diluted with more benzoinol.

If the nasal discharge is marked, order extract of belladonna gr. ⅛ or atropine gr. 1/120 q. 2. h. until the discharge stops and then give at intervals of 4 to 6 hours to control it.

When giving belladonna so frequently, one should not forget that many people have an idiosyncrasy for it and should recall the early signs of accumulation, pupils widely dilated with blurred vision, erythematous

*See Treatment of Pneumonia. *New York Medical Journal*, January 8th, 1910.

eruption, scarlatiniform in character, excessive dryness of the mouth, and rarely a talkative delirium.

I have seen these coryzas outlast the attack until one despaired of ever giving relief and then clear up in forty-eight hours after changing to a new locality.

Of course one must be assured that there is not a suppurative process in one of the sinuses.

I might add that some of the cases run over into a chronic bronchitis or that small abscess cavities form or bronchiectatic cavities and that a patient may become a veritable bacillus carrier.

The nervous system shows the effect of the toxemia in no inconsiderable number of the cases.

Neuritis may occur as after any infectious disease and occasionally a true meningitis; but, as strikingly frequent, follow neuralgias. Marked mental depression, which all too often becomes melancholia, or other psychoses make their appearance. These must be dealt with as under other circumstances.

In children one may see symptoms of meningitis which are more commonly due to a meningismus or serous inflammation rather than to the present of the influenza bacillus or other pyogenic organism.

In such a case a lumbar puncture should be done; first, that by examination of the fluid we may determine the presence or absence of the organism, whether it is purulent or not, that is, whether we have to deal with a purulent or serous meningitis; and second, because such a procedure often brings prompt amelioration of the symptoms. I have seen nothing more striking than the improvement following up this procedure.

I would emphasize two facts borne in upon me by my children's service at Bellevue Hospital; first, that this condition of meningismus, under which I include cases of serous meningitis, is extremely common in many acute infections and also in gastro-intestinal disturbances and second, that the differentiation from a suppurative meningitis is in a large percentage of these cases possible only by a lumbar puncture, a procedure followed by more fruitful results than any other measure of clinical diagnosis with which I am familiar.

In some cases the fever drags out to unusual lengths. This is seen at times in children. They should be put in the fresh air as much as possible and their nourishment properly considered.

It is more than doubtful if any drugs have influence on this prolonged intoxication. When all other measures have failed there is one that has results so striking and on the whole so reliable that it needs no emphasis, namely change of air.

This is more easily attained with children, with whom transportation is a relatively easy problem.

Moreover, a removal to a remote quarter, to an entirely different climate, is not necessary.

Equally good results I have seen by sending cases to places no farther removed from New York than Atlantic City, Lakewood or Greenwich, nor have I been able to determine that the woods or the shore offered any peculiar advantage the one over the other. I have seen a child sent to Lakewood after running a temperature for weeks with prompt subsidence of symptoms, only to relapse on a return home, to as promptly subside again after a second trip to Lakewood. There a longer residence effected the cure. These prolonged cases in children associated as they often are with a cough and a slight bronchitis not infrequently arouse the fear of incipient tuberculosis.

Prophylaxis.—Were the mortality of influenza as high as that of tuberculosis or of pneumonia or were the mortality directly traceable to the infection as in the case of typhoid, no doubt we should more fully appreciate the importance of prophylaxis and urge its carrying out, but we do not look upon influenza as a highly dangerous disease and we do not attribute the deaths from pneumonia to the Influenza infection with sufficient emphasis, so little precaution is taken to protect the individual or the community.

There are three ways in which the disease is especially spread, first by those who are a little ill, are suffering from a "common cold" and move about among their fellows, infecting as they go; second, by the very ill who infect other members of the family or attendants because knowledge of the mode of transmission is not known and precautions are not insisted upon by the attending physician; and third, by the carriers of the bacilli, people with a chronic cough, sufferers from chronic bronchitis, bronchiectasis or abscess.

Lord found the organism present in 25 to 59 per cent. of unselected cases of chronic cough and expectoration in interepidemic periods.

With the first class of cases, patients should be instructed as to the meaning of "common colds" that occur in epidemics, how easily their cough, with its spray of infecting organisms, can pass on the disease of perhaps fatal severity to those in contact with them; that coughing and sneezing should be done into a handkerchief, that sputum should be destroyed and that intimate contact, kissing, etc., should be seduously avoided.

Perhaps no more certain source of infection exists than the common carriers.

How, wedged into a car or train, in the hours of crowded traffic, with sneezing and coughing all about, with insufficient ventilation or such a one as constitutes a draught to blow over the heated skin, could one escape infection? So far as possible these places should be avoided during an epidemic.

Of the second class of cases, the family should be instructed that the patient is a source of infection and that remaining unnecessarily long with the patient increases the danger; the nurse should be instructed to see that

the secretions are received into proper receptacles, vessels provided with 5 per cent. carbolic acid, or into cloths that should be burned; that the clothes in contact with the patient should be sterilized by boiling, that his utensils and thermometer be kept separate and that after he has convalesced, the room should be fumigated with formalin.

With reference to the third class of cases, more difficulty exists until the health authorities make more inquiry into the nature of chronic processes and take measures for the public protection.

CONTRACT PRACTICE IN FOREIGN COUNTRIES.*

By William B. Chamberlin, M. D., of Cleveland.

Whatever may be our personal opinion in regard to the merits of contact medical practice at the present time matters but little. There are two facts of which we must take cognizance. (1) It is an institution which is already firmly organized and flourishing in our midst. (2) It is an institution which has come to stay. With these facts in mind, our thoughts and efforts should be directed toward its proper regulation and control; having in mind not only the welfare of the medical profession but, what is of more import, the welfare of those to whom they minister. The institution with us is still comparatively young, and while we recognize its abuses and dangers, and perhaps appreciate the unfavorable outcome if certain tendencies remain unchecked, certainly our appreciation will be quickened by a brief survey of the contract system as it exists in foreign countries.

In the short time at my disposal it would be impossible to deal exhaustively with the system in general or to describe minutely those in vogue in the various countries. I have accordingly selected the systems of Austria, Germany and England as examples most likely to influence similar institutions among ourselves, and will confine myself to the influence of the contract system upon the welfare of the medical profession, as being the topic in which we this evening are most interested.

In Austria, as the result of a law enacted in 1888, insurance against loss of pay by sickness or accident was made compulsory for all engaged in manufacturing, trade and commerce. Company officials were exempted, if proof was furnished that they were protected in other ways. Officials of the government, state and municipality were further exempted, as were also sailors, foresters, farmers and house servants. This law of 1888, although its many shortcomings are fully recognized, and in spite of most earnest efforts for its amendment, is still in force in its original form to-day, twenty-three years after its enactment. This industrial insurance is administered by organizations known as Krankenkassen, which take their names from the limitations of their scope; Genossenschaftskrankenkassen administering to those in a certain trade and existing only in the large towns; Bezirkskrankenkassen, to those of all trades residing in a certain district; Betriebskrankenkassen, to those working for the same employer, etc. Bruderladen is an old name for association of miners, while Krankenvereine are friendly societies which

*Read before the Cleveland Academy of Medicine, October 20th, 1911.

insure for a certain indemnity in case of illness but do not provide medical attention.

According to this law of 1888, the insured and their families receive free medical attention, care in childbirth and all medicines or other therapeutic measures. In addition the assured receives in case of disability 60 per cent. of his daily wage for a period of twenty weeks. Care in hospital may be considered a substitute for this amount. In case of death an additional amount is allowed for burial. An idea of the increasing popularity of the Kassa system may be gained from the following statistics. In 1890 there were 2,470 K— with 1,548,825 members; in 1905 there were 2,934 K— with 2,844,245 members. In other words, while the number of Krankenkassen had increased only 7.08 per cent., the number of members had increased 83 per cent. The inclusion of other societies would bring the total membership up to 3,082,669, while the inclusion of the families would give a total of over 4,000,000 people in Austria receiving free medical attention. This constitutes 15.4 per cent. of the entire population, while if the statistics are limited to the larger towns, the country districts being excluded, a conservative estimate places over 50 per cent. of the people as included among those who pay no direct fee for medical attention. The effect of such a system upon the medical profession may be deduced from the following:—

Out of 9,204 physicians in Austria over 30 per cent. have a total income of less than (K 1,200) $240 a year, 25 per cent. an income of (K 2,400-3,600) $480-$720, 33 per cent. $720-$1,440, not 10 per cent. $1,440-$2,400, and only 300 physicians in all Austria have an income of more than $2,400. In Vienna alone, out of 1,930 physicians in 1898, only 1,158, or a little more than 50 per cent., had an income of more than (K 1,200) $240. In Bohemia the conditions are still more unfavorable than in Austria. An idea of the financial reward to one engaged in the Kassa business may be gained from the related personal experience of one Gottlieb Pick of Aussig, whose monographs on the subject I can heartily recommend to those interested. After an experience of fifteen years as physician for a Berzirkskrankenkassa, he gives the following data for the year 1906. Number of members 8,448, cases of sickness 10,670. The compiler was only one of a number of physicians employed by the Kassa. In the following he counts an office call as 1 unit, a house visit as 2 units, special services such as bandages or operations as 2 units. In the year of 1907 he treated 2,023 cases, making 397 house visits, 5,474 office calls and 527 special, a total of 7,996 units. For this he received the munificient sum of (K 2,211) $442.20, an average of (27.9h) .0558 cents per unit. As physician to the Betriebskrankenkassa his pay was slightly more. These figures agree with those of other districts and the country in general.

In Austria the control of the Kassa system is entirely in the hands of laymen, who neglect no opportunity to further reduce the miserable fees

paid to the profession for their services. Under the present or Pauschal system a lump sum is paid to a physician or group of physicians for their services to the Kassa, a fixed amount of money for an indefinite amount of work. Little or no choice is allowed a member in selecting his physician. Much of the work is accordingly indifferently or poorly done and dissatisfaction on the part of members is frequent. Any demands for increased fees are met with indifference or flat refusal, for, with little or no organization on the part of the profession, the directors know but too well that a dozen are waiting to take the place of one who resigns.

Not only has the Kassa system reduced to an absurd minimum the fee which it pays for medical service, but, with no income limit to regulate Kassa membership, the influence of the Kassa has been to reduce medical fees in general. The cost of medical attendance per member per annum was (K 2.32) 46.4 cents in 1890, but had risen to (K 3.21) 64.2 cents in 1905. This includes the lay control of the Kassa, which conservative estimates place at 20 per cent., thus leaving in reality but (K 2.57) 42.4 cents to be paid per member per annum for medical attendance. Not only the poor but frequently the well-to-do, and even the rich, take advantage of Kassa membership.

The demands of the physicians for the betterment of their conditions are in the main as follows:—

(1) Kassa membership to be dependent upon income.

(2) Free choice by members among a fairly large number of physicians who have signified their willingness to do Kassa business.

(3) Fee to be determined by agreement between Kassa and Physicians as a whole, not with individuals.

(4) In case of the Pauschal system, limitation of amount of work to be done for a certain sum.

(5) Representation by the profession in the directorate of the Kassa and recommendation by the profession of those fitted to do Kassa work.

It requires only a casual perusal of current medical literature in Austria, or a slight acquaintance with the system at present in vogue, to convince one of the importance of the present struggle to the profession. It is virtually a question of life and death. The continuance of the present system can only mean a deteriorated medical profession, with an ultimate baneful effect upon the community at large.

Current German medical literature is strangely silent on the subject of Kassa practice. With a censored press and the Kassa under state control, the reason is perhaps not difficult to imagine. Two illuminating articles in our literature by Wm. L. Holt, Vice-President of the American Society of Medical Sociology give a fairly clear idea of the situation. The first gives his personal observations in regard to the Kassa in Freiburg.

German industrial insurance is divided into three classes: (1) accident; (2) illness; and (3) old age. There are in all some 23,000 different

Kassas with a membership of over 20 millions. Insurance is compulsory on all whose income is less than $1.60 per day or $480 per year. This great system disburses to its beneficiaries $400,000 per day or $150,000,000 per year. To raise this enormous sum each laborer pays 2 2/3 per cent of his daily wage, amounting to 2/3 of the total amount. The remaining ⅓ is paid by the employer. This insurance provides free medical attention in accident, sickness and maternity cases, free hospital, free drugs, including spectacles, with allowances for disability, convalescence after childbirth, and funeral expenses in case of death. For convalescent cases great sanatoria are provided in the Black Forest. In Freiburg free dentistry is also provided. Treatment in the various specialties, as well as surgical operations, is provided free in the University Clinics.

The conditons in Freiburg may be taken as an example of those existing elsewhere. Here in 1909 there was a membership of 14,577, including 4,000 women. Out of 16,000 families 12,000 were insured. The fee bill is as follows: Office call 15c, house visit first time 32c, subsequent visits 24c, night visit 96c, minor surgical operations, such as passing a catheter or opening an abscess 24-48c additional, reducing a fracture, dislocation or strangulated hernia $1.20, larger surgical operations $2.40-$3.60. Normal childbirth $1.20, difficult obstetric operations $2.40-$3.60. Usually the Pauschal, or total amount set aside for medical fees, is not sufficient, and a corresponding reduction is made. In 1909 this reduction amounted to 13.8 per cent. The total cost per member per annum was $1.32. Druggists, however, received much better treatment than physicians, being required to make to Kassa members a reduction of 20 per cent. from the prices usually charged.

Under the title "Why German Lodge Doctors Strike" Dr. Holt gives some further interesting information. Strikes, it seems, have been fairly common among medical men in Germany for the past ten years. The most famous one was that in Leipsic in 1904. In 1904 the insured in Leipsic numbered 180,000. The fee scale was still that introduced in 1872, day visit 24c with mileage at 12c per kilometre extra, night visits 48c, office calls 19c, obstetric and surgical operations extra. Again this scale might not have been so bad if paid in full by the Kassa. Frequently the amount paid was only 40 per cent. of that charged; the average for a period of years being 58 per cent. In 1904, the demands of the doctors for free choice by the patients of their attendant and for an increase in the Pauschal being refused, the entire profession promptly went on strike, all but three members ultimately joining. The result was free choice of doctors and the raising of the percapita tax to $1.80. So 375 organized lodge doctors raised the price of medical fees 66 2/3 per cent."

At the present time great interest is being manifested by the profession in England in the introduction by Mr. Lloyd-George of the so-called

General Insurance Bill. The reading of this bill in parliament was received by all sides, without regard to party, with the greatest enthusiasm. It is looked upon in many ways as the greatest measure before parliament in two generations. It provides for free medical attendance in accident, sickness and maternity cases and carries with it benefits for those incapacitated by sickness or accident, as well as those subjected to frequent periods of unemployment, where depression from commercial cases is most frequent. The total cost for the first year will be $122,500,000. It is proposed to raise this enormous sum by a tax upon the men, their employers and the state. Whereas the states' contribution in the first year will be but $12,500,000, it is proposed to make this contribution increasingly larger year by year. This insurance will be divided into two funds: (1) the compulsory and (2) the voluntary. Under the compulsory division will be embraced all employed who earn weekly wages or whose annual earnings are under $800, the minimum for taxable incomes. Soldiers, sailors, teachers and certain casual laborers will be exempt, though it is planned to make special provisions for these later. The men are to contribute 8c per week, women 6c, the employer 6c and the state 4c per person. Persons earning under $4.25 per week will contribute less, but their employer is such cases will contribute more. Those over 65 years will be exempt, while those over 50 years of age will receive reduced benefits. Under the voluntary class will be embraced small tradesmen and those who have no employers. Here the men will contribute 14c and the women 12c per week. This general insurance bill includes and extends benefits to approximately 15 million persons. The allowance in cases of illness will be $2.50 weekly to men and $1.75 to women for a period of three months, thereafter $1.25 per week to both, and a disability of $2.25 per week. Persons under 16 will receive only medical attention.

The attitude of the medical profession toward the impending measure since its first reading seems to have undergone a decided change, if one can judge from the frequent editorials and communications in the British medical press. Whereas the measure was received at its reading with enthusiasm by the profession as well as the laity, before its specific details were published and considered, this enthusiasm has now changed and the feeling of hope regarding Mr. Lloyd-George's attitude to the profession has given way to one of general distrust and antagonism.

Up to the present time industrial insurance in England has been voluntary, not compulsory, and all forms of industrial insurance have been under the control of the so-called Friendly Societies. In order to keep the cost of insurance low, the plan of these societies, in England as elsewhere, has been not so much to economize in administration as to drive sharp bargains with the profession for their services. With a profession already overcrowded and the medical colleges of the country each year producing an output which the country did not need, this

has always been easily possible. A man in the insurance work had only to signify his unwillingness to continue at the same or even a reduced compensation. Dozens could immediately be found to take his place at practically whatever fee the directors of the society felt called upon to give. This fee at the present time amounts to (4 S) $1.00 per member per annum, hardly the wages paid to cab drivers and laborers, and includes drugs, bandages and other therapeutic measures. The new measure proposes to divorce medical services from the dispensing of drugs, but only advocates an increase per person per annum to (6 S) $1.50, including both. So the feeling of hope of a fair treatment at the hands of the secretary has given way to one of antagonism and distrust. From many sources it is even being urged that the time is now ripe for a flat refusal of the profession to engage in contract practice on any other basis than the work done. Sir Alfred Pierce Gould, in a timely article in the *Lancet,* urges the profession as a whole to have nothing whatever to do with contract practice, but to insist upon a treatment similar to that afforded to nurses, landlords and tradesmen; while a German correspondent in the same Journal regrets the retention of the per capita basis, which offers a fixed and extremely low amount per individual for an unlimited amount of work, and asserts that the British medical man is asked to begin work at a wage which his German brother has already found niggardly and insufficient. German statistics, according to this writer show that the actual cost of medical attendance and drugs is (10 S 5½ D) $2.67 per member per annum. Certainly the German profession is not overpaid.

As a result of the impending measure the profession in England has been aroused and united in a way never before realized. Mass meetings have been held throughout the country and the attitude of the government toward the profession condemned by the British Medical Association, the General Medical Council, the Royal College of Physicians, the Royal College of Surgeons and many other societies of scarcely less prominence. In response to invitation, the Chancellor has appeared before the members of the British Medical Association and, while certain demands of the profession were acceded to, he declared his utter inability to fix a wage limit for industrial workers. The demands of the British Medical Association at the present time are in brief as follows:—

(1) Insurance to be extended only to those having an income under $10.00 per week.

(2) Free choice among a fairly large number of medical men previously appointed.

(3) Medical and maternal assistance to be regulated and administered by Local Health Commission and not by the Friendly Societies.

(4) The method of remuneration to be adopted by the Local Health Commission in accordance with the preference of a majority of the profession in a given district.

(5) Medical remuneration to be what the profession considers adequate, having due regard to the duties to be performed and other conditions of service.

(6) Adequate medical representation on the various committees and boards of directors.

What attitude the government will take toward these demands is as yet unknown. Certain it is that a united medical profession will be in a position to demand a scale of prices commensurate with the service rendered and befitting the dignity of a profession which to-day is making greater demands upon its members, not only in preliminary training, but also in subsequent effort and self sacrifice than any other calling or profession in the world.

Such, we see, has been the effect of contract practice upon the profession in foreign countries. If statistics with us were as carefully compiled and statements honestly given by members of the profession, would we not perhaps find that conditions in many instances are little or no better than those abroad? How many surgeons in the United States to-day are doing a vast amount of work for a great railway corporation, the only compensation being in many instances an annual pass which they never use? The etiology and the disease, which at no very remote day threatens the life of the profession, is easily recognized. Should not the therapeutic measure be equally plain? A united medical profession, here as in England, can say to industrial organizations and brow-beating insurance companies, "Reduce to a minimum, if you will, the cost of industrial insurance, but this reduction in cost, this underbidding of your competitors in order to gain business must not be by the absurd reduction of medical fees. It must not be at the expense of the medical profession."

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GUMMA OF THE STERNUM.

By Logan Clendening, M. D., of Kansas City, Mo.,
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AND

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E. J., female, negress, *aet.* twenty-four, married at the age of fourteen, but separated from her husband, was admitted to the medical clinic of the University of Kansas, June 8th, 1910. Her family history was uninstructive; her personal history disclosed a somewhat vague account of a suspicious labial sore about six years before.

For the past eighteen months there has been growing slowly but steadily, a tumor in the upper part of the middle of the chest. This at first had been painless, but is now extremely tender and so painful as to interfere with the patient's rest and sleep, and to compel her to stop her work as chambermaid. She had lost about 12 lb. in the last six months. She had been treated at various dispensaries and by various physicians, without success.

Examination revealed a swelling, 3½ by 4½ inches, exactly in the region of the manubrium sterni. It was soft and tender, and two fistulæ discharged a thin seropurulent material having no odor. The inguinal and epitrochlear glands were enlarged. The tibiæ were smooth. There were no scars on the body, no remains of the sore on the labia. Physical examination of the nose, throat, gums, neck, thorax and abdomen revealed no other noteworthy abnormalities.

Temperature 98.6° F.; pulse 86; leucocytes 12,000. The discharge from the fistula was examined for spirochætæ by Mr. Hissem. None was found.

Course.—An aseptic dressing was applied to the tumor and the patient was given a solution of potassium iodide (of the strength of gr. i to drop i) and instructed to take ten drops in milk three times a day and to increase each dose two drops a day, under observation.

June 25th.—Patient is taking 36 grains of potassium iodide three times a day. Dressings have been applied daily. The pain has disappeared.

July 2nd.—Swelling decreasing. Discharge lessened.

July 13th.—Patient feels very well. There is no pain or discharge.

July 26th.—Tannate of mercury, in the dose of gr. i three times a day, was added to the potassium iodide.

August 3rd.—Patient has a profuse flow of saliva, with very sore gums and teeth. The tannate of mercury was discontinued.

September 6th.—Patient has gained 10 lb. The tumor has gone down one-half. It is firm and not tender. There is no pain and no discharge. The fistulæ are healed. Patient is at work as chambermaid.

In view of the common occurrence of gummata in the sternum, or the sternoclavicular articulation, it was a matter of considerable surprise to find almost no reference to it in the general literature. Osler mentions

Fig. 1.—E. J. Gumma of the Sternum.

it neither in his "Textbook on the Practice of Medicine" nor in the chapter on syphilis in "Modern Medicine." Struempell ("Spezielle Pathologie und Therapie," Leipzig, 1907, 16th Ed.) has no reference. Keyes ("Syphilis," Appleton and Co.) has no reference. Goldthwait, Painter and Osgood ("Diseases of the Bones and Joints," D. C. Heath and Co., 1909) has no reference. Nor has Von Leube ("Special Medical Diagnosis," translated by Salinger, New York, 1907). Cabot[1] mentions parenthetically the possibility of its occurrence in this region. Lexer[2] has the same sort of reference. Baeumler, in Ziemssen's "Cyclopedia of Practical Medicine," has a very complete description of tertiary bone syphilis; but, in stating that its special predilection is for bones covered only by integument, he catalogues every such bone except the sternum. Townsend, in Morrow's "System,"[3] quotes Jullien to the effect that out of 69 cases of bone syphilis in general, the sternum was affected

fifteen times. These cases, however, included necrosis, exostosis, and osteitis, as well as periostitis and gumma. Kœnig[4] mentions it somewhat more especially, and in von Bergmann's "Handbuch"[5] there is a very fair description of the diagnosis and treatment.

In spite of this paucity, which to a great extent applies to the ordinarily accessible current medical literature, there being only one reference to gumma of the sternum in the new series of the "Index Medicus"[11] (which I have been unable to verify), the condition must be far from rare.

At the same small medical clinic where this one was observed, two

Fig. 2.—E. J. Gumma of the Sternum.

other cases have been seen within eighteen months: (1) A male, with multiple gummata, viz., a hard, tender plum-sized tumor attached to the sternum on the level of the fourth rib, and one on the inner third of the clavicle. Improvement was prompt under potassium iodide. (2) Young female, with a soft but not suppurating tumor on the manubrium. She was seen only once.

Pathology.—There may be one of two conditions present: First, a periostitis, leading to a *caries sicca* in the underlying bone, and an ulceration or excavation surrounded by a hard bony wall, so that in some cases

the tumor (pus, debris, etc.) can be bodily lifted out from the bone. Secondly, a gumma primary in the medulla of the bone, infiltrating the canaliculi and forming a sequestrum; the periosteum and integument are then affected secondarily.

In this case the bone is certainly affected, as revealed by the *x*-ray negative, for which I am indebted to Dr. E. H. Skinner. Whether the process began as a periostitis, or directly in the bone, it would be impossible to say.

Diagnosis.—The most frequent tumors resembling gumma in this site are tuberculoma and sarcoma. Kuemmell[5] recites a case in which Koester removed a portion of the sternum with a tumor which he believed to be a sarcoma, and which microscopical examination proved to be a gumma. Thus the diagnosis is important. Kœnig states that while both suppurate, a tuberculoma causes more pain and has a thinner, more opaque discharge than a gumma. Craig[6] reports a case of lymphosarcoma (myeloma?) of the sternum, occurring in the course of lymphatic leukemia. Trzebicky[7] has seen cases of chondroma and metastatic hypernephroma in the sternum, either if which might confuse a diagnosis. Jockmann[8] reports osteomyelitis sterni after typhoid, and Longuet[9] states that the most frequent tumors in the sternum are due to infectious diseases. While the photograph of our case somewhat suggests the picture of an aneurysm, the possibility of mistake is slight.

Treatment.—With the statement of Schede and Graff[10] that gummata occurring in the sternum should be extirpated surgically and the patient put upon antisyphilitic treatment, one can hardly agree, in view of the steady favorable decline of the tumor and symptoms under potassium iodide alone. I have never seen a more favorable gumma for demonstrating to students the effect of classic antisyphilitic medication.

Radiography of the Sternum.

The radiographic projection of the sternum upon a negative presents difficulties. The sternum is a thin, cancellous bone, occupying a longitudinal position in the anterior chest wall, corresponding to a similar position posteriorly of the complex spinal column. Attempts to make an *x*-ray examination of the sternum in the posteroanterior position will, therefore, obliterate the shadows of the thin sternum by the heavy shadows of the vertebræ costal margins and the arch of the aorta. We therefore find it necessary to project the shadows of the sternum at such an angle that the bone will present radiographic outlines which are not superimposed upon other bone shadows. This may be accomplished by placing the patient with the chest resting upon the table. The left shoulder is raised slightly, and the patient fixed in position by sandbags, etc. The *x*-ray tube is adjusted so that the direction of the parallel ray is from the left posterior scapular area obliquely toward the right subclavicular

space. This is the oblique left posterior, right anterior position in radiographic nomenclature. Albers-Schœnberg[12] favors a negative taken in the sitting position, with the plate anchored to the chest and the direction of the ray from the right posterior to left anterior. Contrariwise, we would recommend that the patient be lying upon a table or trokoskop as being more favorable to a comfortable adjustment of fixa-

Fig. 3.—E. J. Running from the centre above to the left below is the dense shadow of the vertebral column, parallel to the right of which are the anatomical outlines of the sternum. The upper part of the sternal shadow is occupied by the crescentric shadow of the gumma. Radiating from the site of the gumma and shadow are the outlines of the two clavicles. The apex of the lung shows up above the clavicle and bordered by the shadows of the first and second ribs above. For description of gummatous pathology portrayed, see text of article.

tion measures. The direction of the *x*-ray from left position to right anterior also throws the profile of the sternal shadow outside of the aorta. When the compression cylinder is used it may be adjusted to the area of the left shoulder-blade posteriorly and tilted so that it is focused upon the subclavicular area obliquely opposite.

The trokoskop, particularly the design of Hænisch,[13] lends itself to

sternal exposures. With this apparatus the patient lies comfortably upon a canvas-covered table beneath which is the *x*-ray tube. The plate is held in apposition to the sternum and the patient slightly turned upon the left shoulder in the oblique position. Hænisch recommends, that an examination be made with the fluoroscope before the casette enclosing the plate is adjusted, to insure a correct position.

The exposure can be made with rapidity by the use of an intensifying screen, in one to three seconds, with 20 ampères through the primary of a 15 to 20 inch coil and 10 milliampères through a Walter 6 tube. With a heavier discharge coil or transformer a good picture may be obtained in half a second with the Gehler-Folie intensifying screen. The *x*-ray exposure must at least be made during arrested respiration.

Upon the *x*-ray negative we then obtain a clearly defined manubrium and gladiolus, with the right clavicle distinct, radiating upward and outward. The vertebræ and vertebral rib borders give a confused shadow to the right, and the left lung shadows surround the sternal shadows and extend to the left upon the plate.

X-Ray Report of Dr. Clendening's Case.—In this case the manubrium gives evidence of necrosis and an osteoporosis with gummatous exudation about the sternoclavicular articulation. The luetic bone pathology hardly extends into the gladiolus. There is a crescentric involvement of the manubrium, with scalloped areas surrounded by dark shadows showing the deposition of lime salts in the gummatous exudate. You will notice that the extent of the bone changes is greater than one would suspect from the external signs of this comparatively subcutaneous gumma. There is no involvement of the hilus glands at the roots of the lungs in this case.

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THE TUBERCULIN REACTIONS AND THEIR COMPARATIVE VALUE AS DIAGNOSTIC AIDS.

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In reviewing the literature on the subject, we find, on the one hand, authorities who disclaim the value of tuberculin as a diagnostic aid, and, on the other hand, those who in their enthusiasm regard every tuberculin reaction as positive evidence of active tuberculosis.

The scope of this paper is to discuss the *modus operandi* of the tuberculin reactions in general, also the various methods of application, and what is of the utmost importance, to elucidate a safe guide to the physician, through which he will be able to diagnose early active from latent or healed tuberculosis.

The foundation of the tuberculin-therapy, as well as the diagnostic methods to reveal tuberculosis, is the observation of Koch that tubercular guinea-pigs reacted differently to a renewed infection from healthy ones, in other words showed a certain amount of immunity to reinfection.

Further investigations confirmed the observation of Koch, and recent animal experimentation showed that infected animals developed sensitiveness to tuberculin after a certain inoculation period, said sensitiveness increased as the disease progressed, and diminished and finally disappeared altogether in moribund animals.

Similar observations have been recorded by clinicians on the human being.

It was further demonstrated that the dose of tuberculin used for these tests, as well as the degree of infection in the experiment animal, accordingly produced various results.

The tuberculin reaction manifests itself differently, therefore, according to the dose, the site of application, the clinical stage of the disease, and also the individual susceptibility towards the tubercular endotoxines and exotoxines.

The phenomena of the reactions are at times local, that is manifested as an inflammatory process at the point of application; and again general, of which at times a characteristic fever reaction is the only demonstrable effect of the systemic reaction. Other signs of the general reaction are malaise, lassitude, pain in the back and legs. At times a focal reaction takes place, consisting of severe inflammatory changes in the neighborhood of tubercular foci, producing even necrosis. All these reactions manifest themselves to the eye or ear of the observer, or upon palpation, according to their location and intensity.

General and focal reactions occur only, as a rule, when a sufficient quantity of tuberculin is introduced subcutaneously and absorbed into the general circulation. In exceptional cases, minimum quantities of tuberculin in highly sensitive individuals, no matter in which way applied, produce the above severe reactions, showing the danger of the indiscriminate use of concentrated tuberculin for diagnosis.

Various methods of application have been advised; five of the most important are cited below:—

1. Cutaneous method, after Moro. (Inunction of tuberculin on the unbroken skin.)
2. Cutaneous method after von Pirquet. (Inoculation of tuberculin after superficial scarification of the skin as in vaccination.)
3. Intracutaneous or intradermal method after Mantoux and Roux. (Injection of 1/100 mgrm. of tuberculin into the skin of the leg.)
4. Subcutaneous method, after Koch. (Injection of tuberculin under the skin for absorption into the circulation.)
5. Application of tuberculin to the mucous membranes. (Of which the conjunctival method after Wolff-Eisner and Calmette is the most important.)
6. Installation of a definite quantity of tuberculin into the conjunctival sac.

Of the many tuberculins advocated for these tests, the tuberculin O. T. (typus humanus) has stood the test of time and is the best, because it is as reliable as any other tuberculin; in addition, we have more comparative data from past experiences to guide us in our work with it, and it is of great importance for the sake of uniformity, that a reliable tuberculin be used as a standard by all investigators.

Statistics vary from 50 to 100 per cent. according to the prevalence of tubercular infections; suffice it to say that in our metropolitan centres nearly every adult has been infected at one time in his life. Recent investigations of Roemer and Joseph, and formerly von Behring's, tend to locate the infection period in childhood. Out of the large percentage of tubercular individuals, only a small percentage suffers or succumbs to the disease.

It becomes, therefore, of paramount importance to differentiate between active and latent tuberculosis.

The cutaneous methods, after Moro and von Pirquet, reveal both active and inactive tuberculosis, except during the first year of life.

Ellermann and Erlandson have modified the von Pirquet test recently, and perfected a technique to establish the degree of tuberculin sensitiveness in tubercular subjects. Their method is complicated and awaits confirmation.

It might not be amiss to mention here that Muench, Wolff-Eisner and others have used the von Pirquet test for therapeutic purposes; however, I must warn against the use of concentrated tuberculin in this procedure, on account of its liability to produce dangerous focal reactions.

The subcutaneous method has the above disadvantages, and further, on account of its production of general and focal reactions, is dangerous to the patient.

The conjunctival method does not reveal all the early and active cases with one per cent. tuberculin solutions, as advocated by Wolff-Eisner; stronger solutions prove dangerous to the eye.

The safest method to test qualitatively the tuberculin sensibility is the intradermal test with definite quantities of tuberculin, as recently clini-

Showing intradermal test forty-eight hours after inoculation.

I. Sol. carbolic acid ½ per cent.
II. 1/10,000 mgrm.
III. 1/1,000 mgrm.
IV. 1/100 mgrm.
V. 1/10 mgrm.

cally tested by van Balen of Holland, and by the writer at Washington University Hospital, Medical Clinic.

The physician wishes to know whether the symptoms of his patient are due to an active tuberculosis and not whether his patient has a latent focus somewhere in the body. Furthermore, it is essential to use a method, which will in no way aggravate a tubercular process and endanger the chances of arresting the condition.

It is in the diagnosis of early active and doubtful cases that tuberculin

is supreme. In advanced cases, on the other hand, where the tuberculin sensitiveness has disappeared, a diagnosis stares the observer in the face, while in inactive cases tuberculin has only a statistical value.

I have added to the intradermal method a control test of 1/10 c.c. of a ½ per cent. solution of carbolic acid, three extra dilutions of tuberculin O. T. representing 1/10 mgrm., 1/1,000 mgrm., and 1/10,000 mgrm., and changed the site of application from the leg to the arm.

The technique is as follows:—

The place of inoculation over the biceps muscle is cleaned with alcohol; then with a sterile platinum needle and glass syringe, the eye of the needle pointing upwards, inject 1/10 c.c. of the following five solutions:—Phenol, ½ of 1 per cent.; O. T., 1/10,000 mgrm., O. T. 1/1,000 mgrm., O. T., 1/100 mgrm., O. T., 1/10 mgrm., at a distance of 5 cm. from each other, and allowing the solutions slowly to infiltrate the skin, producing a small papule.

A positive reaction takes place as a rule several hours after the inoculation to 1/10 mgrm. and 1/100 mgrm., and often also to 1/1,000 and even to 1/10,000 mgrm., showing greater intensity to the stronger solutions. After twelve to twenty-four hours the infiltration becomes visible and palpable, and the inflammatory reaction increases accordingly. At the end of forty-eight hours it has reached its greatest intensity. We see now a small central tubercle encircled with a zone of redness, shading off gradually into the healthy tissues. This zone of redness varies from 1 to 2 cm. The reaction fades away, as a rule, after two days, but persists at times for several weeks. The control shows a slight erythema, which becomes imperceptible after a few hours. A slight fever reaction occurs, occasionally due to a faulty technique, causing a portion of the tuberculin to be placed subcutaneously instead of intradermally.

Roemer has proved that the intradermal method is the most reliable one in animal experimentation.

Since the local reaction takes place in healthy tissue at a distance from the tubercular lesion, it can also be used in the tuberculin therapy, especially in fever cases, where an extremely mild method is advisable. The reactions being determined by doses ranging from 1/100 mgrm. downwards to 1/10,000 mgrm. will serve as a most important guide for the therapy of the case.

Since the index of the tuberculin sensibility is determined by the intradermal reaction, the dose of tuberculin to be used therapeutically is ascertained.

The intracutaneous reaction manifests itself after doses of tuberculin O. T. varying from 1/100 mgrm. downwards to even 1/10,000 mgrm.: accordingly we can start the test with 1/10,000 mgrm. if desirable.

The following conclusions are at present applicable until more precise methods are demonstrated:—

1. That we can demonstrate by the intradermal test, in doses from

1/10,000-1/100 mgrm., nearly all doubtful and early cases of active tuberculosis.

2. If after a 1/10 mgrm. injection no reaction occurs, we can exclude tuberculosis.

3. From reactions to doses between 1/100 and 1/10 mgrm. we can only conclude that latent tuberculosis is present.

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MEDICAL AND SURGICAL PROGRESS.

GOUT, ITS DIAGNOSIS AND TREATMENT.

A REVIEW OF RECENT LITERATURE.

By Albert E. Taussig, M. D., of the Editorial Staff.

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Ever since Garrod some fifty years ago demonstrated the presence of uric acid in the blood of gouty patients, the true nature of this interesting affection has been the subject of endless discussion. The wide spread tendency, which lasted well into this century, to explain a great variety of obscure affections by the vague terms "uricacidemia", "too much uric acid" and the like, finally ended in a sceptical reaction that led many men to refuse to uric acid any pathologic significance what-

ever. Within the last ten years, however, our knowledge of the metabolism of gout has increased rapidly, culminating in the beautiful investigations of Brugsch and Schittenhelm. They were led to define gout as a disturbance in the fermentative processes that control the metabolism of the purin bodies. Uric acid is derived exclusively from the disintegration of substances contained in the nuclei of cells. The substances may have two distinct sources: the nuclei of cellular tissue in food and the nuclei of body cells that have undergone destruction. The former is called "exogenous" uric acid and may ordinarily be diminished or increased at will, the latter is the "endogenous" uric acid, which varies considerably in health, but still more in certain diseases. Normally, the nucleo-proteids are split up, by ferments, with the production of nucleinic acid. From this in turn a variety of so-called purin bodies are derived, first the amino-purins (guanin and adenin), then xanthin and hypoxanthin, and finally uric acid. The last is excreted in part as such, in part is split into ammonia and carbonic acid.

In gout this entire process is seriously interfered with. The faulty purin metabolism leads to the production of an abnormally small amount of uric acid but this latter is both destroyed and excreted to an insufficient extent. The result usually but not always is an accumulation of uric acid in the blood, as was shown by Garrod half a century ago. Gudzent has recently shown that uric acid in the blood, exists always as a sodium salt, a mono-sodium-urate, also called sodium biurate. This salt may exist in two forms, one very soluble but very unstable, the other stable but much less soluble. In health the body seems to have the power not only to excrete the uric acid as soon as formed, but in case of a temporary retention to convert the poorly soluble form into the more easily soluble and more readily excreted form.

In gout the ability to handle uric acid seems diminished in every respect. The result is a gradual accumulation of mono-sodium-urate in the blood and in the less soluble form at that. Sooner or later the limits of solubility are passed and we have a deposit of the urate in crystalline form, chiefly in the subcutaneous tissue or in the joints. There is still some difference of opinion as to whether an acute attack of gout is due to the deposit or to the reabsorption of the urate crystals in the joints, but on the whole the latter seems the more likely. For one thing, it has long been known that the amount of uric acid, excreted in the urine, is ordinarily abnormally small, especially just before an attack. During the attack, however, it is usually increased and may attain extraordinary proportions. After a severe attack, the patient feels unusually well for awhile. This is all in harmony with the theory that an acute attack is due to a change in metabolism that temporarily enables the body to dispose of its uric acid and that the acute arthritis is due to the going into solution of the urate crystals previously deposited in the joints.

Diagnosis.

Clinical Picture.—In a review of this sort, it would be out of place to discuss the symptomatology in any detail. The clinical picture of gout was as well known to Sydenham as it is to us and there have been no important additions to our knowledge of this aspect of the disease for over a hundred years. It is certain, however, that while less frequent than in Europe, gout is by no means uncommon in this country but that only a small minority of the cases are ever correctly diagnosed. One reason

for this is the fact that the so-called atypical cases are far more frequent than the typical ones. A multitude of obscure affections of the joints, skin, digestive, circulatory and nervous system are really gouty though never diagnosed as such. The presence in the ears or elsewhere of subcutaneous, gouty tophi usually clears up the diagnosis. In their absence, a diagnosis may be impossible or at any rate possible only with the help of modern refinements of diagnosis which will be described below.

Uric Acid in the Blood.—One of the most constant phenomena of gout is the presence of uric acid, or rather of urates, in the circulating blood. Other conditions may produce this uricemia. Thus an individual, whose diet is rich in nuclear matter, may show uric acid in the blood (exogenous uric acid); in pneumonia and in leucemia the rapid destruction of the white corpuscles, uniformly loads the blood with purin bodies; in chlorosis a similar condition, but less marked, has been noted; in nephritis the excretion of uric acid may be so interfered with as to lead to its retention in the blood. These conditions are however usually readily distinguished from gout. If, in the absence of pneumonia, chlorosis, leucemia and nephritis, the patient is put on a purin-free diet (to be described below) for a number of days, and still shows the presence of uric acid in the blood, the diagnosis of gout is practically certain. The constant absence of uric acid in a number of tests speaks probably but not certainly against the diagnosis of gout.

The simplest method of demonstrating the presence of uric acid in gout is that described by Garrod some fifty years ago. A little blood serum or blister fluid is placed in a watch-glass, acidified by means of acetic acid and slightly concentrated. A thread is then placed in the mixture and if uric acid is present in excess, its crystals may form on the thread. This test is however not at all delicate and, even in outspoken gout, fails far more often than it succeeds. Until recently the only trustworthy methods of determining the presence of uric acid in the blood was by elaborate and difficult methods that required 100 c.c. or more blood. This last fact alone prevented the utilization of these methods for clinical purposes. Within the last year and a half however, two new methods have been described that promise to be of practical diagnostic importance.

The first is that of Roethlisberger.* His is of extreme delicacy requiring only a few drops of blood. It is based upon the ability of uric acid to reduce silver salts. The method in brief is as follows: A strip of filter paper, previously treated with silver nitrate solution is soaked with a solution of sodium carbonate; upon this moist paper are deposited one or more drops of the blood serum; the paper is then placed in ammonia for 15 minutes, washed and dried. If the blood contains uric acid a permanent dark spot will appear upon the paper, the blackness of which depends upon the amount of uric acid present. One disadvantage of this method is that it must be carried out in the dark-room or at least by very weak artificial light. Nevertheless its simplicity is such, that if further work confirms its trustworthiness, it will be a valuable addition to our diagnostic methods.

A less simple, but still more promising method is that of Kowarsky. From a vein, near the bend of the elbow, 10 c.c. of blood are aspirated and immediately stirred into 30 c.c. physiologic salt solution. The mix-

*The entire apparatus, with paper, pipettes, etc., may be obtained from M. Schaerer, A. G., in Berne, Switzerland. It is called "*Blut-Urikometer*," and costs Fr. 27.50.

ture is then poured slowly into 50 c.c. of a boiling solution of 0.5 per cent. acid sodium phosphate. Having been diluted and again boiled, whereby the proteids are nearly completely precipitated, the whole is then poured into an evaporating dish and concentrated on the water-bath to 3 or 4 c.c. These are then placed in a centrifuge tube and centrifugated. The supernatant fluid is poured into another centrifuge-tube, a few drops of 10 per cent. sodium hydrate added and the mixture saturated with ammonium chloride. After standing over night, the excess of ammonium chloride is dissolved by the addition of a few drops of water and, after centrifugation, the sediment is treated with a few drops of strong hydrochloric acid. Uric acid, if present, crystallizes out and may be recognized microscopically or better still by means of the murexid test. It may even be estimated quantitatively, but this will rarely be of practical importance. This method appears fairly complex, as here described, but is far simpler than the older methods of Salkowski, Hopkins or Krueger and Schmid and has the advantage of requiring much less blood. It has been carefully tested and it seems that normal blood is always entirely negative or nearly so, whereas gouty blood, which contains from 2 to 6 milligrams of uric acid per 100 c.c. of blood always gives a distinctly positive reaction.

Uric Acid in Urine.—At one time it was thought that an excess of uric acid in the urine was characteristic of gout. This is by no means the case and indeed a single urine examination can never throw any light upon the presence or absence of gout. Ordinarily the amount of uric acid depends chiefly upon the amount of purin bodies in the food. If however this source of uric acid is eliminated by placing the patient on a purin-free diet, much information can be obtained by means of systematic urine examinations, and this in two ways.

A sluggish elimination of urates is characteristic of gout. If the patient is on a purin-free diet, the twenty-four-hours urine will contain a small and fairly constant amount of urate. If he now takes a single meal rich in purin bodies, say a dish of sweet-breads, the elimination of the urates may be watched. Normally it is rapid. The next day's urine is very rich in urates, but, on the day following, the amount has dropped to its former level. In gout, however, the elimination is much slower and less intense, extending over several days.

In the paroxysm, gout also produces characteristic urinary changes. Just before its onset and during the first day or two of the acute attack, the amount of urates in the urine is abnormally small. Later and throughout the attack, the amount of urates excreted is great and may attain extraordinary levels, gradually returning to normal after the conclusion of the paroxysm. This behavior of uric acid excretion can of course be used for diagnosis only if the patient is on an absolutely purin-free diet, but that will usually be the case. Then however it does become a characteristic, though not invariable manifestation of gout.

A simple method of following the excretion of uric acid in the urine is by means of the purinometer of Walker-Hall. The uric acid is precipitated by means of magnesium chloride and ammoniacal silver nitrate solutions and its bulk is read off directly as in Esbach's albuminometer. Like the latter, it does not give entirely trustworthy results but is sufficiently accurate to detect a considerable increase or decrease in the daily elimination of uric acid.

Radiography in Gout.—A useful method of distinguishing between gouty and other joint affections is by means of the *x*-rays. If a radiogram of the affected joint, showing as much detail as possible, is taken, one

can often distinguish between gout and the other arthritides at a glance. The urate deposits are far more permeable to the rays, than the lime salts of the bone tissue and hence are clearly visible as light spots in the bones near the affected joint. One is thus readily enabled to distinguish between gouty arthritis and the other chronic joint affections for which gout is most readily mistaken. The gouty joint is characterized not only by the pale urate deposits, but also by the entirely intact joint surfaces. In chronic articular rheumatism, on the other hand, the articular cleft is markedly narrowed; in primary chronic polyarthritis, it is almost gone and there is more or less complete anchylosis with marked atrophy and sclerosis of the bony tissue; in osteo-arthritis deformans, we seen distinctly destructive processes in the cartilage and osteophytic proliferation about the junction of bone and cartilage. In his work on diseases of metabolism, Umber has published a series of radio-grams illustrating the differences between the appearances of the joints in these various arthritides. Occasionally, however, the situation is not so clear. The gouty process may involve a joint previously altered by some other chronic arthritic process. In this case, the changes produced by the latter may overlie and hide the gouty concretions and the radiogram may actually mislead the observer. Thus Magnus-Levy in a recent communication reported a case that clinically seemed clearly gout but in which the radiogram showed merely the presence of an inflammatory flat-foot. The subsequent history of the case showed that the patient had undoubtedly gout and that the paroxysms were gouty attacks in the already altered joints of the flat-foot. This only means, however, that in gout, as in other pathologic conditions, no single sign is in itself absolutely pathognomonic.

Treatment.

During the Attack.—In the treatment of the acute gouty paroxysm we are still practically helpless. A long series of medicaments have been suggested and vaunted in turn but, perhaps with the exception of an occasional anodyne, such as a hypodermic of morphine, all have proven useless or worse than useless. This is especially the case with colchicum. That it can often cut short the paroxysm is undoubtedly true. But it does so by interfering with the absorption of the sodium urate crystals from the affected joint. The result is that the patient is relieved for the time being but, since the deposit remains unabsorbed, the next attack comes on all the sooner and the more violently. Moreover colchicum, in therapeutic doses, is a heart poison and doubtless the sudden death of gouty patients during the paroxysm has often been due to its use. Sydenham was the first to advocate an expectant attitude* and Trousseau, nearly two hundred years later, strongly urged that the physician do literally nothing at all until the paroxysm had passed. This attitude still holds good today. Perhaps a suggestion recently made by Falkenstein deserves to be considered an exception to this rule. If a local anesthetic (Falkenstein uses eusemin) be injected into the immediate neighborhood of the inflamed joint, the patient will be relieved from pain for several hours. When the pain returns, a fresh injection can be made. The advantages of this procedure are that it does not interfere with the restora-

*Sydenham, De Podagra et Hydrope, 1683. Hoc in morbo dolor amarissimum est naturae pharmacum, qui quo vehementior est, eo citius praeterlabitur paroxysmus, atque insuper et longior erit intermissio et magis perfecta.

tive processes going on in the joint and does not produce the undesirable constitutional effects inseparable from the repeated use of morphine hypodermically.

Diet.—In the treatment of chronic gout and for the prevention of acute paroxysms the strangest and most diverse dietaries have been advocated. Of them all the only one that has stood the test of time is expressed in the phrase in which Sydenham advised moderation in eating and drinking: "Primum in cibo potuque mediocritas est observanda." Theoretically something is to be said for the so-called purin-free diet. This consists in the avoidance of those foods that are especially rich in nuclear matter. They are meats and fish of all kinds, including meat soups and gravies, beans, lentils, peas, spinach, asparagus, mushrooms, oatmeal, certain fruits, tea, coffee, cocoa and the beers. The theoretic basis for this diet is the fact that gout is essentially a disturbance of purin metabolism. That being the case, the body has difficulty in caring for its endogenous uric acid, and would still further be hampered by a considerable supply of uric acid from without. It must be remembered however that a diet from which the above articles are eliminated in the long run becomes very unsatisfactory, so that patients usually rebel. Moreover, it is by no means certain that it is indispensible or even beneficial. We do not as yet know whether the body finds the same difficulty in managing exogenous as endogenous uric acid. For diagnostic purposes, if we want to determine the endogenous uric acid in blood or urine, a purin-free diet is of course indispensible.

A very interesting dietetic suggestion based upon careful experimental work was made by S. Cohen in a recent communication. He proceeded from the consideration that the greater the amount of sodium present in the sodium urate molecule, the less soluble the latter. Thus the monosodium urate present in gouty joints contains twice as much sodium as the hemisodium urate circulating in the blood. It seems rational to conclude that the smaller the amount of sodium taken in with the food, the less the tendency to the formation of the sodium-rich urates and therefore the less likely the formation of gouty deposits. He investigated this problem by observing the behavior of uric acid deposited under the skin of guinea-pigs under various conditions. He found that the greater the amount of sodium, especially in the form of carbonate, in the food the less the absorption of uric acid from such artificial deposits. The administration of potassium salts, or of foods rich in potash, caused active absorption of such tophi eves if considerable sodium was given. It would therefore seem desirable to give gouty patients very little food rich in sodium carbonate and as much as possible of food rich in potash. A typical example of the former is meat; of the latter, potato and rice. Table salt seems to make less difference.

Medicinal Treatment.—The various so-called "uric acid solvents" (lithia salts, piperazine, citarin, uricedin, urosin, etc.) have justly fallen into disuse. Their vogue was always due far more to the manufacturers' advertising literature than to any real experimental or clinical demonstration of their usefulness. At the best, they are "test-tube remedies"; able to dissolve uric acid in the test-tube but without efficacy in the body. The alkalies too, as a class, have been shown to be harmful rather than beneficial in gout. Gouty blood is not less alkaline than normal blood. Moreover, the greater the amount of sodium in the urate molecule, the less soluble it is. An essential feature of gout is the inability of the body to convert the relatively insoluble monosodium urate

(sodium biurate) into the more soluble hemisodium urate (sodium monourate). An exception to the harmfulness of alkalies in gout may possibly be found in the potassium salts, not because of their alkalinity but because of the ability of the K atom to displace the Na in the insoluble urates. Their value however still awaits demonstration.

A much more promising method of treatment consists in the continued administration of large doses of hydrochloric acid, as first advocated by Falkenstein. He was first led to its use by the observation that gouty individuals nearly constantly showed a condition of complete or approximate gastric anacidity. In such doses, moreover, hydrochloric acid not only stimulates the activity of the liver, in which much of the uric acid destruction takes place, but also tends to diminish the sodium content of the blood. The increasing vogue of hydrochloric acid in gout is however based rather on empiric than on experimental grounds and is doubtless given additional impetus by the reaction against the use of alkalies. Falkenstein, Schmidt, Brugsch and others report large series of cases beneficially influenced by this treatment, sometimes strikingly so. Thus Schmidt, himself a sufferer from gout, says: "For nearly two years I have been taking conscientiously 60 drops=4.5 g. pure offic. 45 per cent. hydrochloric acid daily. In spite of this great quantity of HCl, I have noticed not the slightest ill effect upon my system nor the appearance of any distaste for the drug, on the contrary, after each meal, I experience a distinct desire for it. In my case, the results were simply astonishing. Although, in severe cases, Falkenstein promises results only after the lapse of many months or even a year, with me they were immediate, inasmuch as during the first quarter year the gouty attacks were only abortive, *i. e.*, lasting an hour or two, without much pain and without incapacitating me from work. Since this time, for nearly two years, I have been quite free from gout, feel bright and eager for work, although for a long time I have not troubled myself about diet or abstinence from alcohol, but on the contrary from time to time indulge myself in the joys of the table (of course only experimenti causa)."

"This striking result," he goes on to say, "I experienced not only in my own case, but in that of 7 patients, in my private practice, all with typical gout, some of them tortured for years by frequent and most violent attacks of acute gout, with involvement of the larger joints. The worst case, a merchant 40 years old, confessed the other day that, contrary to my instructions, he had never departed from his habit of drinking 3 bottles of beer daily and of indulging every Sunday in champagne, a beverage justly dreaded by the gouty. Nevertheless, since beginning the hydrochloric acid treatment, he had never had an attack."

His, while he admits the usefulness of the acid treatment, remarks that he has sometimes seen it fail in particular severe cases. The acid is given in large doses, from 50 to 90 drops of concentrated hydrochloric acid daily, well diluted and sipped during or after meals. The average dose is 20 drops three times daily; this should be taken in a pint or more of water. No ill effects need be feared from this or even larger doses.

Falkenstein recommends that, together with the hydrochloric acid, some iodine compound be administered, preferably a new synthetic, "iodglidin." He believes that the iodine facilitates both the excretion of uric acid and the elimination of the alkalies from the blood.

One other drug deserves mention in this connection. In 1908, Nicolaier and Dohrn discovered and studied the pharmacology of phenylin-carbonic

acid, the best of whose derivatives is being marketed under the name of atophan. Atophan, in some manner not thoroughly understood, has the power when administered in half gram doses of greatly stimulating the excretion of uric acid. If a healthy individual, on a purin-free diet, be given atophan, the amount of uric acid excreted in the urine increases rapidly, then diminishes but remains considerable as long as the drug is given. Upon discontinuing it, the uric acid in the urine almost disappears; then slowly returns to the normal. It is as if the atophan almost swept the system clear of uric acid. Frank and Bauch have observed similar phenomena when the drug was given to gouty patients and Weintraud reports good results in acute gout. While the remedy is still on trial, it has a thoroughly rational experimental basis. Its action is apparently the opposite to that of colchicum which rather interferes with the elimination of the offending substance.

Radium.—The most interesting recent development in this field is the therapeutic action of radium in gout. It had long been known that certain European springs exercised a distinctly beneficial action upon gout and it had also been noted that this same water when exported and used by the patient at home seemed quite inert. The explanation of this phenomenon is now clear. These springs are all of them highly radioactive and the water contains in solution considerable of the so-called "emanation," a decomposition product of radium. This emanation, being a gas, readily escapes from solution, and hence is lost in transportation. It seems, however, that it is not even the emanation that possesses therapeutic properties but a derivative from it, called radium D. As the latter is a solid, soluble only in strong acids, it cannot be administered directly. The emanation itself must be given, and allowed slowly to produce the radium D in the body.

The mode of action, in gout, of the emanation has been cleared up by the experiments of Gudzent and others. The former found that when the soluble sodium urate is produced in the test-tube it is rapidly converted into the less soluble form. If, however, the contents of the test-tube are exposed to the action of radium or its emanation, not only is this process delayed, but under favorable conditions it may be even reversed, the soluble form being produced from the insoluble, and the former converted into ammonia and carbonic acid. Gouty patients, saturated with the emanation, excrete their uric acid like normal individuals and their blood, ordinarily constantly containing uric acid may be rendered entirely free from the latter. Even tophi and gouty deposits in the joints are rapidly absorbed with the production of local necrosis. For a more detailed account of these phenomena the reader must be referred to the excellent articles of Kionka and His.

The clinical results of the emanation treatment of gout are very encouraging. Thus His reports 28 cases so treated; 4 were not improved, 24 were greatly relieved. Several patients reported that, during the year which had elapsed since the conclusion of their treatment, they had remained free from attacks. In two cases, subcutaneous tophi had also disappeared. Other observers report similar results. One interesting feature of the treatment is the so-called "reaction." The vigorous administration of the emanation is often followed by a typical attack of acute gout. This is evidently due to the going into solution of the sodium biurate in the joints, and according to Gudzent, is rather to be welcomed as indicating that the emanation is actively at work. In old and confirmed cases of gout, however, such a reaction may not be free from

danger and in them radium should be used cautiously, if at all. Marckwald and Nagelschmidt have shown that, with careful dosage of the emanation, such reactions can usually be avoided.

As regards the administration of the emanation, several methods are in vogue. The emanation being a gas, it can evidently best be administered by inhalation and this can best be done in an emanatorium. A stream of oxygen is made slowly to bubble through a liquid in which a considerable quantity of radium salt is dissolved. The oxygen, carrying the emanation with it, passes into a small room, into the air of which it is distributed by means of an electric fan. The patients sit in the room for an hour or more, several times daily. It is obvious that such an apparatus requires a considerable plant and is very expensive. A continually growing number of institutions, especially in Germany, has acquired this equipment, but the need of a simpler method of administering the emanation is keenly felt. The portable inhalation apparatus all suffer from grave defects, into which we cannot enter here. The administration of emanation-water by mouth, the hypodermic use of radio-active fluids, radio-active baths and the like, have all their adherents. Their value has still to be demonstrated. Certainly they do not as yet rank with the inhalation emanatoria.

Summary.

The points brought out in this review may briefly be summarized as follows:—

Etiology.

1. Gout is not characterized by an excessive production of uric acid as was formerly supposed.
2. The gouty deposits are produced by deficient elimination of uric acid and by the tendency towards the production of the less rather than the more soluble form of sodium urate.

Diagnosis.

1. The gouty patient, on a purin-free diet has constantly urates present in his blood. Thus phenomenon gout shares with a number of other diseases from which however it may readily be distinguished.
2. A single urinary examination is of no diagnostic value in gout. A daily determination of the uric acid in the urine, during the attack, or after a meal rich in purin-bodies, may give results that are almost pathognomonic.
3. Radiography is very useful in distinguishing the gouty from the other forms of arthritis.

Treatment.

1. In acute gout, active treatment is dangerous. The use of colchicum should be abandoned.
2. A purin-free diet is the only rational one in gout.
3. The use of large doses of hydrochloric acid deserves a trial; the use of alkalies, with the possible exception of potassium salts, is irrational.
4. The most promising method of treating gout is by means of the inhalation of radium emanation.

ACUTE POLIOMYELITIS.

A REVIEW OF RECENT LITERATURE.

By Alfred Friedlander, M. D., of the Editorial Staff.

1. Lovett: Infantile Paralysis in the United States and Canada in 1910. (*Amer. Journ. Diseases of Children,* August, 1911.)
2. Dixon: Epidemiologic and Etilogic Studies of Acute Poliomyelitis in Pennsylvania. (*Amer. Journ. Diseases of Children,* October, 1911.)
3. Kennedy: Acute Poliomyelitis. (*Amer. Journ. Diseases of Children,* August, 1911.)
4. Morse: Acute Poliomyeloencephalitis. (*Boston Med. & Surg. Journ.,* January 12th, 1911.)
5. Levandowsky: Poliomyelitis—Collective Abstract. (*Jahrbuch fuer Kinderheilkunde,* Vol. 73, No. 4, April 1st, 1911.)
6. Marsh: Epidemic Anterior Poliomyelitis. (*Brit. Journ. Chil. Dis.,* July, 1911.)
7. Currie and Bramwell: Incubation Period of Poliomyelitis. (*Review of Neurol. and Psychiat.,* Vol. IX, p. 10, 1911.)
8. Koplik: The Cerebral Forms of Poliomyelitis. (*Amer. Journ Diseases of Children,* August, 1911.)
9. Committee of the American Medical Association on Control of Poliomyelitis—Report. (*Journ. Amer. Med. Assoc.,* October 14th, 1911.)
10. Flexner: Control of Epidemic Poliomyelitis. (*Amer. Journ. Diseases of Children,* August, 1911.)
11. Knox: Treatment of Poliomyelitis. (*Amer. Journ. Diseases of Children,* August, 1911.)
12. Flexner and Clarke: (*Journ. Amer. Med. Assoc.,* Vol. LVI, p. 585, 1911).

[Note.—No attempt at a full bibliography is given here, of course. In a recent collective abstract of the American literature of the subject from January to July, 1911, Wachenheim notes fifty-six articles.]

"The great prevalence of infantile paralysis in the United States in 1910 and its rapid increase in the last two or three years in this country are matters which demand our serious attention." These words of Lovett express the general concern which is felt everywhere concerning the spread of poliomyelitis. The literature is full of the subject. Careful investigation along the lines of epidemiology, direct etiology, pathology, clinical picture and treatment is being carried out in many places. Certain facts have been brought out with great clearness and a summary of these is here presented.

According to Lovett, for the ten years 1894-1904 inclusive, 157 cases of the disease were reported in the United States; an average of about

fifteen a year. In 1910 there were about 8,700 cases reported. There is a widespread and general distribution of the disease in this country, with, as a rule, a focal occurrence and radiation from these foci. The southeastern section of the country shows the fewest cases.

Study of the epidemics in many communities has brought out the following general facts, repeatedly determined:—

The disease is found in scattered foci with cases radiating from these foci. It reaches its height in the late summer; it follows the lines of travel; it affects mostly children in the first dentition, the mortality rate ranges from 3 to 15 per cent. In October the epidemic usually begins to die out.

Lovett then points out that the mere collection of routine data cannot settle the all-important question of etiology. For this, careful house-to-house study made, if possible by salaried medical men, on full time is necessary. Such study should if possible be made during the epidemic. The value of a central bureau or committee for the regulation and supervision of this work and the interchange of information is of course apparent.

The Health Commissioner of Pennsylvania, S. G. Dixon, has just published a careful study of several epidemics occurring in that state in 1910. Nearly 800 cases were studied intensively by the department of health, all possible epidemiologic factors being investigated with great care. For full details the original, very instructive, article should be consulted. Among the observations made were the following: of 773 cases, 59 gave a distinct history of exposure to previous cases. Nationality seemed to play no etiologic role. In forty-four instances secondary cases developed in the household. The prevalence of other diseases in the community was not as great during the outbreak of poliomyelitis as has been described by some authorities.

The seasonal influence was that generally reported (vide ante). It is of special interest to note that in the blood of patients during the acute stage, and in the blood of monkeys, experimentally inoculated, "an organism was found, different in morphologic characteristics from any heretofore described, which may or may not on further investigation prove to be the etiologic factor in the causation of the disease." (At this writing this finding has not been confirmed by other observers.—Ed.)

With reference to etiology there is nothing alsolutely definite to report. The virus is filterable (belonging in the class of organism of foot and mouth disease, etc.). It is very resistant to external agencies. It withstands glycerinization for months, drying over caustic potash for weeks. It withstands freezing, but is killed by exposure to temperature of 45° C. to 50° C. for one-half hour. It is not certain that it has ever been cultivated outside the body, though bouillon inoculated with the virus has become turbid. But paralysis has *never* been induced by inoculations with these cultures.

Lately workers in the Rockefeller Institute have succeeded in producing the disease in monkeys by the intracerebral injection of an emulsion, made from the bodies of common house-flies, which had been fed on portions of spinal cord obtained from a poliomyelitic monkey. It would seem that the transmission of the disease is not by contact or infection as in measles or scarlet, not by the ingestion of toxic material, but rather by the intermediate agency of insects. This theory is however absolutely not proved as yet, and further experiments and observations are necessary for the settlement of the question of mode of transmission.

Kraus has recently shown that the injection of poliomyelitis virus (sterilized by addition of phenol) protects the monkey against subsequent inoculation of active virus. If this were confirmed for man a large therapeutic field would be opened. Indeed active immunization of monkeys has been achieved by repeated inoculation of small doses of virus over long periods of time.

The presence of certain definite antibodies in the blood of these immunized animals has been demonstrated. Active filtrate containing virus has been mixed with the blood serum either of children or of monkeys recovered from the disease. This mixture was incubated for an hour at 37° C. and then injected into the brain of normal monkeys. In no instance did paralysis follow. (Marsh.)

Netter and Levaditi have shown that the blood serum of a child after an abortive attack also contains a similar protective agency. Efforts to produce a therapeutic serum by inducing active immunity in the lower animals have not been successful as yet. But it is worth noting that normal sheep's serum possesses a definite neutralizing power when mixed with the filtered virus. This power can be reinforced by injections of cord emulsions of recently paralyzed monkeys. Whether this can be carried to a degree sufficient to provide a therapeutic serum is not yet established.

Symptomatology: "If we think of the disease as a poliomyeloencephalitis with meningeal complications and appreciate the fact that the disease may affect any or all parts of the gray matter of the central nervous system and in all possible combinations we shall better understand the innumerable manifestations of the disease and be less likely to overlook it or mistake it for some other condition."

These words of Morse clearly present the difficulties of diagnosis. An exhaustive review of special symptoms is quite out of place in such an abstract as this.

The period of incubation apparently varies from 3-15 days. Currie and Braunwell had the opportunity of studying a sharply localized epidemic in which the incubation period averaged four days. The general prodromal symptoms most commonly observed are: irregular fever ranging from 101° to 104°, rigidity of and pain in the neck muscles, severe disturbances in the gastrointestinal tract, usually ushered in by vomiting and marked general hyperesthesia. Upon this later symptom most authors are inclined to lay very great stress.

In the preparalytic stage the cerebrospinal fluid exhibits definite evidence of the round celled infiltration of the meninges. Within forty-eight hours of inoculation the fluid is found to be under increased pressure, usually with marked increase in the cellular elements, largely of the polymorphonuclear variety. A little later the cytologic picture changes, and the cells are now predominantly of the lymphocyte type. At this time the fluid may be opalescent. These changes have disappeared by the time the palsies are manifest. The blood picture in the early stages is either negative or there is a definite leucopenia.

The Wickman classification as to types is generally recognized:—

1. The ordinary spinal form.
2. Progressive form, usually ascending (Landry type).
3. Bulbar paralysis polioencepalitis of the pons.
4. Acute encephalitic form.
5. Ataxic (cerebellar) form.

6. Polyneuritic form.
7. Meningitic form.
8. Abortive form.

Without discussing all of these forms in detail, it may be well to call attention to recent investigation in some of them. The progressive form usually runs an exceedingly rapid course. In a case recently observed by the author of this review, the child showed symptoms of pain in the legs on one morning. He died on the following afternoon, having shown complete paralysis, cyanosis, difficulty of breathing and inability to swallow in the meantime. Several cases of this type have been observed in the epidemic now existing in Cincinnati. This form is nearly always fatal, and usually runs a peracute course.

Koplik has contributed an excellent paper, clearly defining the picture of the encephalitic type of the disease. The general picture is cerebral, the symptoms are cerebral with in certain cases added palsies. Thus if the nuclei of the oculomotor nerves are affected, we have with the cerebral symptoms an opthalmoplegia of greater or less extent. If the nuclei of the facial nerves are affected, the cerebral symptoms are supplemented by facial palsies. If the process extend still further down bulbar symptoms occur. (These latter cases are apt to be fatal.)

Some of these cases offer the greatest difficulties in diagnosis, especially from certain forms of meningitis, because these cases often simulate either meningococcic meningitis with isolated basic palsies or meningitis of the tuberculous type. Koplik's paper deals in detail with several forms of this general type. The old view that poliomyelitis was purely a motor lesion is not held at all any more. The reason for this is the exceeding frequency of cases of the polyneuritic type. The pains here may be in the joints more often are indefinite, a whole extremity being painful. On account of the pain, the extremities are often held as rigid as possible. The combination of rigidity and resistence is only possible of course when some muscles are left intact. As Morse remarks, this combination of flaccidity and spasticity leads to many errors of diagnosis during the acute stage.

Much attention is now being directed to the abortive type of the disease. According to Frost (and other observers) abortive cases are doubtless very frequent in all epidemics of any extent.

The recently published report of the committee of the American Medical Association on the control of poliomyelitis (which incidentally should be read in its entirety by all those interested in the subject) calls especial attention to the possibility of dissemination by "Abortive and clinically unrecognizable cases. The existence of such cases often so mild as to be ambulant has been inferred on clinical evidence and confirmed by the demonstration of apparently specific microbicidal properties in the blood serum of a number of suspected persons." It is of course manifestly impossible to give a comprehensive picture of all forms of the abortive type. In the presence of epidemics of the disease however, cases coming under any of the following classifications of Wickman should be regarded as being suspicious, at least until definite diagnostic criteria have been furnished.

(a) Cases running under the picture of a severe general infection.
(b) Cases showing marked symptoms of meningeal irritation (menin-
(c) Cases in which pain and general hyperesthesia are marked (influenza-like).
(d) Cases with severe gastro-intestinal symptoms.

Diagnosis.—The general consensus of opinion is that the diagnosis of poliomyelitis is at present impossible before the onset of the paralysis.

The general symptoms afford no definite indications, the blood picture is not constant. The symptom complex of fever, gastro-intestinal disturbance, and severe general hyperesthesia with rigidity of the neck muscles is a very suggestive one. The value of lumbar puncture at this time as a diagnostic aid is probably considerable. The fluid is under increased tension, the number of cellular elements is very greatly increased. In the very early stages the polymorphonuclear cells predominate, later these are replaced by lymphocytes. Sometimes this change only occurs with the advent of the paralysis.

Prognosis.—The mortality in the different epidemics has varied from 3-15 per cent., with an average of about 7 per cent. With the recognition of the abortive type there has also come a change in our view as to the outlook quoad restitituo ad integram. The majority of these abortive cases make a complete recovery. Even in cases with definite paralysis complete recovery is reported in at least 10 per cent. of the cases. As is well known the severity of the initial paralysis affords no indication of the amount of permanent damage. The newer views as to pathology, namely that the condition is essentially an interstitial (perivascular exudate with edema, readily afford the explanation as to the retrogression of many apparently severe initial paralysis. The ascending, bulbar and the meningetic cases offer the worst outlook as to recovery. Even in these cases death rarely occurs after the seventh day.

Treatment.—The general recommendations of the committee of the A. M. A. include: Isolation and screening of all patients, disinfection of all discharges, fumigation of premises on release from isolation. So far as prophylaxis is concerned, experimental evidence is in favor of the use of hexamethylenamin (Flexner and Clarke) though as to this point there is still some discussion. It has been found that a 1 per cent. solution of peroxide destroys the virus, and a nasal spray of such strength has therefore been recommended. Among others however, Flexner has called attention to the fact that such a spray may be very irritating to the nasal mucosa and thus do possible harm. He advocates the use of menthol sprays in the usual strength.

With reference to direct treatment, all authors are agreed as to the therapeutic value of rest. With this the general therapeutic measures applicable to acute infections of all kinds should be included. Warm baths are held to be of value, and hot packs are also recommended. As soon as the disease is suspected hexamethylenamin (urotropin) should be given in full doses. The clinical and experimental evidence as to the value of this drug is contantly growing. It will be remembered that Flexner and Clarke have recently demonstrated that when this drug is given in full doses to monkeys, intracerebral injection of the virus of poliomyelitis altogether fails in a certain number of cases to produce paralysis, whereas in others the incubation period is prolonged from six to eight to twenty-four days.

In addition during the acute stage, symptomatic treatment, especially for the relief of pain, is indicated.

After the subsidence of acute symptoms absolute rest should be maintained until all sensitiveness along the nerve trunks has disappeared. During this stage massage and electricity are absolutely contraindicated.

After all hyperesthesia has disappeared, and while the patient still remains recumbent, mild electrical treatment should be instituted. The

faradic current should be used if there be response, if not the galvanic. The value of strychnia is probably not great, in the earlier stages it may even do actual harm.

Massage and muscle training as suggested by Sachs and Strunsky are of much value in addition.

Another point worth noting is that the early coöperation of physicians and orthopedic surgeon in these cases may often be productive of the greatest good.

In conclusion it may be well to again call attention to the fact that the Rockefeller Institute for Medical Research of New York City announces that it will devote its resources very largely during the present season to the study of infantile paralysis and to the treatment of acute cases of the disease in its hospital. Physicians and health officers desiring to coöperate in this investigation may do so by sending information concerning the occurrence and prevalence of this disease or by referring acute cases to the Hospital of the Rockefeller Institute. Dr. Flexner renews his request of last year that whenever possible, a portion of the spinal cord and of the nasopharyngeal mucosa derived from fatal cases of the disease be sent to him. Specimens should be preserved in glycerine and sent by mail to Simon Flexner, M. D., 66th St. and Ave. A., New York City.

THE SURGICAL TREATMENT OF BONE AND JOINT TUBERCULOSIS.

A REVIEW OF RECENT LITERATURE.

By Nathaniel Allison, M. D., of the Editorial Staff.

1. Alapy: The Results of the Conservative Treatment of Tuberculosis of the Hip and Knee. (*Zeitschr. fuer Orth. Chir.,* Vol. XXVII, pp. 243-278, 1910.)
2. Ely: Joint Tuberculosis in Children. (*Amer. Journ. Orth. Surg.,* Vol. IX, No. 1st, August, 1911.
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4. Schussler: A Contribution to the Operative Treatment of Paraplegia from Tuberculous. Spondylitis. (*Archiv. fuer Klin. Chir.,* Vol. XCIII, No. 4.)
5. Sohler: The Treatment of Surgical Tuberculosis with Trypsin. (*Muench. med. Wochenschr.,* No. 46, 1910.)

Alapy, in an excellent analysis of his work for ten years, sets forth the results which may be expected by properly used conservative methods in the treatment of bone and joint tuberculosis. All of his cases were of less than fifteen years of age. Plaster-of-Paris was used exclusively as apparatus. The author states that the apparatus of Hessing, which he at first used, he has found it advisable to discontinue. Deformity has been corrected by traction. He has watched the progress of the disease by taking radiograms in series, and he believes that it lasts as an active process from 3 to 12 months. After the process has become quiet, it is only necessary to apply a plaster which secures the pelvis and runs to the knee. The plaster spicas are changed every 10 or 15 days during the period of progressive improvement; afterwards, every month, and at each change a search should be made for a possible abscess. He has not found it necessary to excise fistulae, nor to perform forcible corrections. After the hip disease has become cured, and there remains an attitude of deformity, he advises a sub-trochanteric osteotomy, with correction of the deformity. Between the years of 1897 and 1907, Alapy has treated 122 cases of hip disease and has kept a careful record of complete observation on these cases. These were selected from 622 cases of hip disease which passed through his service. In 24 per cent. the results were excellent; that is, there was mobility of the joints, without shortening; in 29 per cent. the results were very good; in 14 per cent. fair, and in 33 per cent. bad. The tipping of the pelvis and an establishment of a solid joint seems to be a good result as far as walking is concerned; he found that 62 per cent. of his cured cases could walk without symptoms; 13 per cent. by limping, and 23 per cent. had to use a cane. It is difficult to appreciate the degree of shortening. It was less than 3 cm. in the

majority of cases, this corresponding favorably with the statistics of Wagner-Brun's 5 cm., and Lorenz's 3.87 cm. Atrophy of muscles was very variable and seemed to be associated with the gravity of the process. The character of the gait is an important consideration in the estimation of good results. He believes that the gait of an ankylosed hip is, perhaps, the best. Twenty-one per cent. of his cured cases walked perfectly; 35 per cent. walked well, and 19 per cent. became fatigued with active walking. Comparing these results with those obtained by early resection, Alapy has found that the mortality is very nearly the same, but the function is very much better in the cases treated conservatively. Those where resection has been done do not possess a solid, stable hip and they have shortening of from 6 to 11 cm. The duration of treatment is about three years, when conservatism is employed. It appears to be shorter where resection has been done, but the after-treatment of resection, to prevent deformity and contraction, takes a much longer time. Against the conservative treatment are mentioned the frequency of suppuration and the dangers of general tuberculosis. The results of Alapy, as far as suppuration is concerned, were excellent—better than those of other observers, and he attributes this to careful surveillance and to the injection of iodoform-glycerine. He had 2 cases die of general tuberculosis—one ten days after the first cast of milliary tuberculosis, and the other seventeen days after the first plaster was applied, the cause being not exactly clear. The author finds that his statistics here are about the same, so far as mortality is concerned, as are the statistics of Lorenz and others, where forcible correction has been used in the treatment of hip disease. The author's results in the treatment of tuberculosis of the knee are equally favorable, and his paper indicates the value of careful, conservative treatment in these cases.

Ely has pointed out that the reason for confusion in the treatment of joint tuberculosis is a failure to recognize the fundamental difference in treating adults and children. Eminent surgeons, with wide experience, in treating the joints of adults, have attempted to apply the ideas thus gained to the treatment of children's joints; and, on the other hand, those whose work brings them into contact with children have sought to carry out their theories upon adults. This is a great mistake; the structure of the bones in children and in adults, as well as the resisting powers of each, are not the same. Unmixed tuberculosis exists in bone only in its red marrow. In joints it affects also the synovia. It is limited to these two tissues, and is, therefore, localized. It is never encapsulated, and we cannot remove it. When a secondary infection is added, other tissues become vulnerable, and we have, instead of a localized disease, a widely diffused one. A tuberculous abscess, or joint which is opened, becomes, invariably, secondarily infected. Radical operations on the joints of children entail interference with the growth and the danger of unsightly and crippling deformities. The red marrow and synovia, the only tissues ever infected in pure joint tuberculosis, owe their presence in the joint and near it largely to the function in the joint; the less function there is in the joint, the less these tissues will be in it, and therefore, the less food will there be for the disease. The function of a joint is motion. If we can immobilize the joint, we can prevent the spread of the disease and best forego an indication for surgical operation. Holding fast to the principles of avoiding secondary infection and shortening in a joint will meet the requirements of treatment as pointed out by the pathology. In addition to this, the general health of the pa-

tient must be considered. The erection of hospitals in crowded cities for children with tuberculous joints is an anachronism; glass sun-parlors and closed wards are an abomination. Ely has been led to these radical statements by a careful study of the pathology of bone and joint tuberculosis, and surely what he says seems to indicate the reasons for the success which follows the proper conservative treatment of these conditions.

In direct contrast with these two papers is that of Huntington, who believes that the removal of the focus of tuberculosis at the knee, at the shoulder, the elbow and the ankle is a feasible surgical procedure, and one fully accredited. He further believes that early tuberculosis of the hip should be attacked by operative surgery. He thinks that conservatism may become a fetish. Huntington reviews the well-known arguments for and against operative treatment in tuberculous bone disease and goes on record as firmly believing in the advantages of certain early operations in certain cases. He implies that abscesses are due to conservative treatment—or, at least, that they may be prevented by operative measures. He, apparently, has had a very fortunate experience with the few cases that have come under his treatment, which consists of performing the so-called focus-eradicating operation at the neck of the femur. He believes that this operation obviates the risk of general infection, that it shortens the time of treatment from six years to five or six months, and also that with it there would be no prolonged periods of illness and suffering, no abscess formation, no shortening of the limbs, no crippling or ankylosis. These claims seem rather fanciful to anyone who has had experience, even with the literature of the operative side of bone and joint tuberculosis. A paper such as his is harmful, as it, perhaps, encourages the roughest attempts to eradicate bone and joint tuberculosis from children by operative measures.

That certain operations are advisable is beyond doubt true, but the greatest care should be exercised in deciding when an operation should be performed. A case reported by Schussler is of interest in this connection. Here a paraplegia had lasted for one year and there seemed to be no evidence that spontaneous recovery would take place. After a laminectomy of the seventh and eighth dorsal vertebrae, it was found that the spinal canal was roughened, but that the bodies of the vertebrae seemed normal. A few days after this operation the patient could dorsally flex the foot to a right angle and the spasticity of muscles disappeared gradually, so that at the end of seven months the patient could walk unassisted, and from then on improvement was rapid.

Another tendency in the treatment of these affections is that toward injecting substances into the area of the disease, with the hope that such injections will cause a cure of the process. Perhaps the last substance injected is trypsin. Sohler experimented with trypsin, and has found that it is a worthless injection, being both painful and dangerous. The trypsin not only dissolves the diseased tissue, but affects the normal tissues, and the chances of cure were made less by the fact that the joint cartilages were loosened, and that the soft tissues were invaded by the pus. The hyperemia and irritation caused by the trypsin had better be produced by some substance, or in some manner which is less dangerous to the patient.

In general, it may be said that tuberculosis of the bones and joints has been proven to be most successfully treated by conservative measures, and this is especially true in the case of bone and joint involvement in childhood.

DIAGNOSTIC AND THERAPEUTIC NOTES.

VERONAL.—von Noorden (*Therap. d. Gegenw.*, 1911, No. 6). Prof. von Noorden has found that veronal is a much more efficient somnifacient when combined with a small dose of phenacetine. If there is cough, he also adds a little codein. An average dose would be: veronal 0.3 gm., phenacetin 0.25 gm., codein phosphate 0.03 gm.

A NEW USE OF YOHIMBIN.—Fritsch (*Deutsch. med. Wochenschr.*, 1911, No. 27). Fritsch finds that the bladder disturbances of old people, that show themselves chiefly as incontinence or as bladder atony are favorably influenced by small doses of yohimbin. One tablet daily for three days, followed by an interval of three days, whereupon the medication is resumed, usually suffices. Good results have also been obtained in juvenile incontinentia urinae.

MICROSCOPIC EXAMINATION OF BILE.—Petry (*Wien. klin. Wochenschr.*, 1911, No. 26). Bile may be obtained for examination by introducing 200 gm. olive oil into the fasting stomach and withdrawing it after a proper interval. The microscopic examination of the bile so obtained often gives useful diagnostic information. In cases of cholelithiasis the bile almost always contains concrements microscopic in size. These are either small individual stones or tiny crystalline splinters of larger ones. In either case, the diagnosis of gall-stones is justified.

A NEW TREATMENT OF EPILEPSY.—Fackenheim (*Muench. med. Wochenschr.*, 1911, No. 35). In 1906, Dr. L. E. Self of Clairette, Texas, observed the curious case of a man who, having suffered for fifteen years from epilepsy, was bitten by a rattlesnake; he recovered and thereafter remained entirely free from epileptic attacks. When Dr. Self reported this case in 1908 he had kept him under close observation for two years. Dr. Ralph Spangler, of Philadelphia, had for some time been experimenting with dilute rattlesnake poison in a variety of diseases and was led by Dr. Self's observation to try it in epilepsy. In the New York Medical Journal of September 3rd, 1910, he reported eleven cases so treated with very definitely encouraging results, all of these being improved and some of them apparently cured. Dr. Fackenheim of Kassel received some of the poison from Dr. Spangler and reports five cases treated with it; none of them cured as yet, but all of them greatly improved.

When properly administered, rattlesnake poison, or crotalin, as the purified product is named, seems quite free from danger. One death is reported, to be sure, but that was a five-year-old-child who received doses that would have been large for an adult. When injected, not oftener than once a week and in doses slowly increasing from five to twenty milligrams, no constitutional ill effects have been observed. The local reaction is however sometimes very severe and may last several days.

Crotalin is obtained by squeezing out the contents of the poison sack of the rattlesnake, crotalus adamanteus. The poison is dried, pulverized, purified, redissolved and preserved sterile in sealed ampules, each of which contains a single dose.

Cytodiagnosis in Gastric Disease.—Loeper and Binet (*Soc. Méd. d. hôpit.,* 1911, May 5). The writers examined the water obtained by lavage of the fasting stomach for cellular elements and believe that diagnostic conclusions can be drawn from the nature of the cells found. In gastric ulcer, without hemorrhage, they found red blood cells, epithelial cells and leukocytes; in gastritis, they found white blood cells of all kinds and bits of glandular tissue; in cancer, large polynuclear cells, staining deeply and rich in glycogen. These observations, if correct, would be of great importance, but obviously they require confirmation.

Abdomino-Rectal Gymnastics in Chronic Constipation.—Fernet (*Journ. de Med. et de Chir.,* 1911, No. 13). For the rather frequent cases of functional constipation without an organic basis, Fernet, in a recent address before the Academie de Medicine of Paris, advocated systematic abdominal and rectal gymnastics. Every morning the patient, before rising, lies flat on his back and with shut mouth takes five or six slow, deep inspirations as purely abdominal as possible. The two hands placed upon the abdomen enable the patient to gauge the depth of the respiration and are of appreciable aid in carrying out this procedure. After a few moments' rest, the deep respirations are repeated and so on, four or five times. These respiratory gymnastics put into action successively the diaphragm and the abdominal muscles and produce an efficient massage of the organs contained in the abdomen. In the intervals between the deep respirations, a light colonic massage may be practiced in the usual manner. Often this results in a desire to defecate, which should however be resisted.

After breakfast, which should be slowly eaten and carefully chewed, the patient goes to the closet. If defecation does not result spontaneously, the respiratory gymnastics should be resumed, alternating with anal exercises. These consist of alternate gentle attempts at defecation and retention, being thus alternate contractions and relaxations of sphincter and levator ani. This will usually result in a movement; if it does not, the rectum should be washed out by means of an enema. If persisted in, this procedure will usually result in the establishment of daily, spontaneous evacuations. Where it fails absolutely, the cause is either some anatomic lesion responsible for the constipation or a failure, on the part of the patient, to carry out accurately the instructions outlined above.

CORRESPONDENCE

ASEPSIS IN MODERN PRIVATE OBSTETRICS.

ROODHOUSE, ILLINOIS, November 13, 1911.

To the Editors of the Interstate Medical Journal:—On page 1083 of the November number of your JOURNAL, Dr. Palmer Findley (in his article on the Surgical Treatment of Puerperal Sepsis) makes the following statement: "To-day it may be fairly stated that the percentage of morbidity and mortality of puerperal sepsis in hospitals has been materially reduced while in private practice there has been little or no reduction."

Now I think the doctor errs in the latter part of his statement, *i. e.*, that sepsis is as frequent in obstetrics now as formerly in private practice. The assertion will not apply to this locality at any rate. (Green Co., Ill.) Probably the doctor has examined the mortality reports and bases his statement upon his findings but of this I am quite sure that in the last 12 years I can recall only 3 deaths from puerperal sepsis in this section. The doctors whom I have in mind in this locality attend from 30 to 80 cases of obstetrics annually and it is seldom indeed that we hear of a case of puerperal sepsis. I have been told by older practitioners that 25 to 30 years ago the trouble was much more common. My observation has led me to believe that the rural practitioner (as a class) handles obstetrics as carefully and as skilfully as the city practitioner and I have observed the methods of both, while in the city doing post-graduate work and my practice in the country. Similar statements to the above have been made in other medical journals and I think the time has arrived for a protest from the country doctor. The doctors in this locality who make any pretense of doing careful and up-to-date work carry their operating gowns, soap, antiseptics, and sterile nail brushes, and there is no better surgical basin than an earthen milk crock sterilized by heat. In fact the laity in this community have learned that puerperal sepsis is a preventable disease, and if a doctor should have a very few serious cases I am inclined to think he would soon be out of an obstetric practice. Occasionally we have sepsis following a criminal abortion, but such cases are handled with gloves, and especial care is taken that instruments, clothing, etc., are sterilized before attending obstetrical cases afterwards. Trusting you will give this space in your JOURNAL, I am fraternally.

H. W. SMITH.

OMAHA, November 18, 1911.

Editors, Interstate Medical Journal:—I am in receipt of your communication of the 16th instant requesting a brief reply to the enclosed copy of a letter signed by Dr. H. W. Smith of Roodhouse, Illinois, who takes exception to my statement that there has been little or no reduction in the percentage of morbidity and mortality of puerperal sepsis in private practice.

The doctor construes my statement as a direct reflection upon the country doctor. Let him read his own quotation of my statement and

he will see that there was no direct reference made to the country doctor. "Private practice" obtains in the city as well as in the country, and is a part of the day's work of the attending obstetrician to maternity hospitals as well as of the general practitioner in city or country. Hence we are all in the same boat. And who would maintain that the parturient woman is as well safeguarded in the home as in a well regulated maternity? In the days of Semmelweis the maternity wards were hot beds of infection, but to-day the safeguards surrounding the inmates of modern maternities are such as to minimize the sources of contagion. In 1847 the mortality of child bed fever in the Vienna Maternity was over 10 per cent. Semmelweis made an immediate reduction from over 10 per cent. to about 1 per cent. by the introduction of definite rules pertaining to the management of cases by the students, assistants and midwives. Now we boast of a mortality not greater than one-fourth or one-third of one per cent. in our modern maternities.

Do these safeguards, which have well nigh banished puerperal sepsis from our modern maternities, prevail in the homes of our private cases? The doctor may be ever so exacting in his enforcement of surgical principals and his good work be undone by the nurse who may know nothing of surgical cleanliness.

I know of no reliable statistics of the obstetric work done in this country bearing upon this point, but we have statistics compiled by Winckel on 7,000,000 cases in Germany which shows the mortality from child bed fever was about 30 per cent. greater in the country and provincial towns than in 25 of the large cities where the work was largely done in maternities.

My own impressions have been acquired not only from the literature, but to a greater degree from personal observations. When we consider the morbidity as well as the mortality of child bed fever, we are profoundly impressed with its frequency. It is a matter of every day experience that I examine women with pelvic inflammatory lesions who date their troubles from a miscarriage or child birth, and yet upon questioning them, they are not aware that they had fever in child bed. All they know is that they got up from their bed slowly and that they have suffered ever since. All this frequently goes on without the knowledge of the physician for want of routine visits throughout the puerperium. The doctor is right when he says child bed fever is preventable, but it is manifestly unfair to hold the medical profession accountable for the meddlesome interference of unskilled nurses, of ignorant patients and, last but not least, for the existence of latent gonorrheal infections which account for not less than 12 per cent. of puerperal infections.

If Dr. Smith will try the experiment of making a systematic examination of one hundred women who have borne children, I am sure he will find a surprising number among them who date their complaint to child birth and that not a small per cent. of them will reveal some pelvic inflammatory lesion, the final result of a puerperal infection.

PALMER FINDLEY.

PROLONGED PREGNANCY.

TORONTO, November 14, 1911.

To the Editors, Interstate Medical Journal:—Dr. Gillespie was very kind in honoring me by writing a "review" of my short article on "Prolonged Pregnancy," published in the INTERSTATE MEDICAL JOURNAL of

October last. This review is published in the *Lancet-Clinic,* November 4, 1911. While it is scarcely expedient to attempt to discuss all the points raised it seems advisable to make a few comments.

The evils of protracted pregnancy have been recognized for a long time, but definite knowledge of such evils is comparatively recent. Many obstetricians have been studying the question very carefully for the last fifteen years, and have reached conclusions which are singularly alike. I should strongly advise anyone who takes special interest in this subject to read an article by Joseph B. De Lee, published in *"Surgery, Gynecology and Obstetrics,"* July, 1907. In speaking of the effects of prolonged pregnancy on the child, he says: the head becomes "harder," the greater "ossification" being "striking," "spinal column is less flexible," etc., which anomalies cause "lack of cephalic moulding," "occipito-posterior positions," "prolonged and fruitless labor," "forceps," "hard extractions," "extensive injuries," "postpartum hemorrhage." It should be stated, however, that these few expressions give one only a partial idea of De Lee's clean and concise description of such evil results.

Herbert M. Little, for several years head of the service in the Montreal Maternity, in an article on The Induction of Labor, published in *"The Journal of Obstetrics and Gynecology of the British Empire,"* September, 1910, says: "The frequency of protraction of pregnancy is becoming more and more widely recognized, and, according to the authorities in Winckel's System, occurs in 16 per cent. of all pregnancies. During the last few years there have been a number of serious cases of dystocia, particularly among the private patients in the hospital, on account of the birth of a child unusually heavy, even though the pelvis was normal. Against induction of labor in these cases nothing can be said."

Dr. Gillespie is a total stranger to me, so far as I know, and his tone and attitude towards me in accusing me of "eagerness to foist his (my) pet delusion upon the profession" are incomprehensible. However, that is unimportant, and will not affect my attitude towards him, which, I hope, will be courteous. He has raised a point in connection with the babe of thirteen or fourteen pounds which is well worth considering. My statement that "the probable increase in the tenth month is 2,000 gms.," is to some extent misleading. Such increase occurs in only a limited proportion of cases, but an increase of 900 to 1,400 gms. (approximately two to three pounds) is quite common. The greater increase only occurs when the child remains healthy after term, which many of us think is not generally the case. We think however that no one is yet in a position to express very definite opinions in that regard.

The statistics given are not my own, and I don't happen to know whether they are exactly correct or not; but I think they are generally accepted. I fear that I have been misunderstood with respect to occipito-posterior positions. I simply mean that they occur with undue frequency in labors after prolonged pregnancy. Whether such be cause or effect need not now be discussed.

Dr. Gillespie says: "Whenever by bimanual manipulation the head of the child cannot be made to enter the mother's pelvis the time for considering the immediate necessity for inducing labor has arrived." This is an old rule, and a good one, especially in the case of slightly contracted pelvis; but many of us do not rely on it alone in prolonged pregnancy. Dr. De Lee probably has such a rule in mind when he advises cephalometry according to Perrat's plan. As I understand him he examines his patient in the ninth month, takes into consideration all the circumstances

and conditions, and decides when she has reached term. He then waits one week, and if labor does not come on he sets a date to induce it. I presume his rule is not to let a patient go more than eight to fourteen days beyond term before interfering. In considering any individual case we should study the situation in all its aspects. The relationship between the child and pelvis is only one of the important points.

Let us briefly run over the various phases in prolonged pregnancy. First: As to mother: The emotional element is seriously affected, there is anxiety with loss of sleep, the general health is impaired, various organs and tissues become more or less diseased, there is probably fatty degeneration of the uterine muscle (Bossi). As to child: It is frequently or generally unduly large, it is altered in consistence, the head is not only unduly ossified but also changed in shape chiefly because of greater parietal diameter.

When labor comes on the uterine contractions are irregular and defective, the accompanying pains are severe, the contractions after many weary hours cease at the time when the greatest expulsive force is required, interference becomes necessary, there is difficult extraction. After the completion of the third stage the mother is exhausted, post partum hemorrhage is frequent, septicemia is not uncommon, at best recovery is slow, and in many cases the patient is crippled for life. The child is frequently still-born, or, if alive, quite cyanotic, and feeble in every way, often dying within two or three days.

Most, if not all, of these very serious conditions and results are fairly well recognized, but are not properly appreciated in their entirety. Most obstetricians do not interfere in any case, some interfere when "symptoms indicate," a few interfere before conditions become serious. Upon the whole I think De Lee's rules of procedure are excellent. In my own practice for the last seven years I have generally interfered if labor has not come on in from two to twelve days after term. It is not considered desirable to refer to certain exceptional cases in this communication.

Between twelve and fifteen years ago three very distressing cases of prolonged pregnancy followed by disastrous results, came under by observation. In all three the labors were prolonged and very difficult. Two mothers and three children died. I happened to learn much from those cases, and I have been studying ever since. I feel very keenly the responsibility I assume when I teach students comparatively new procedures, and I endeavor to be very careful and cautious. In addressing my fellow practitioners who have had more or less experience I speak with more freedom, and always with a hope that by an interchange of opinions we may learn much from each other. I don't know that I have taught much during my professional career, but I do know that I have learned much from the *other fellows.*

I am not wedded to the method of procedure I have described. I like the method described by De Lee, which is very much like that which I learned from Dührssen many years ago, and which I now use especially in certain accidents and procedures of earlier pregnancy. I shall use nearly the words of De Lee who says the method is "not original with him." He uses a tubular curved packer, and a special gauze (a woven bandage) made up in strips five yards long (kept in sterile jars). He uses the tubular packer which is put in the cervix, and by gently rotating the instrument he packs all round the lower uterine segment. The operation is simple and can be done without an anesthetic.

ADAM H. WRIGHT.

BOOK REVIEWS.

A Treatise on Diseases of the Eye. By John Elmer Weeks, Professor of Ophthalmology in the University of Bellevue Hospital Medical College, Medical Department of the New York University; Surgeon to the New York Eye and Ear Infirmary, etc. With 528 engravings and 25 full page plates in colors. 944 pp. Lee & Febiger: New York and Philadelphia. 1910.

In preparing this volume, it has been the aim of the author to produce a treatise on ophthalmology that shall "enable the undergraduate in medicine to obtain a sufficiently comprehensive and trustworthy knowledge of the subject, a book to which the practitioner of medicine may refer for information regarding questions concerning the eye, and also a book which may be of use to the specialist in ophthalmology." It will be generally admitted that Dr. Weeks has accomplished the objects alluded to above. Too frequently the medical author, in attempting to kill three birds with one stone, misses every one and produces a book which is unsatisfactory alike to the undergraduate, the general practitioner and the specialist. But no such failure can be recorded against Dr. Weeks' most excellent book. Every one of its 944 pages is packed with information. The presentation is direct and while lacking in literary frills, is distinguished by a quiet elegance of diction. Altogether it is a work which can be unreservedly recommended to all who desire a mirror of modern ophthalmic teachings and practice.

Hints for the General Practitioner in Rhinology and Laryngology. By Dr. Johann Fein, Privatdocent at the University of Vienna. Translated by J. Bowring Horgan, M. B., B. Ch. Late House Surgeon at the Hospital for Diseases of the Throat, Golden Square, London, W. With Forty Figures in the Text and Two Photographic Plates. New York: Rebman Company. Price, Cloth $1.50.

To one who has worked with Dr. Fein in his own clinic, and who has accordingly had there an opportunity to follow his careful methods, the appearance of the above work is indeed a gratification. Nothing is more unfortunate than for the practitioner of little or no training to attempt treatment or operations of which he is incapable. On the other hand there are many cases referred to the average specialist which could be treated quite as successfully by the physician who referred them. This little book should teach the practitioner his limitations, as well as his possibilities. If it does this it will be a distinct contribution to medical literature in this country, and will have fulfilled the purpose which the author so well expresses in his preface. Unfortunately, we fear the book may not have the circulation which it so well deserves.

New and Non-Official Remedies, 1911. Containing Descriptions of the Articles which have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association, prior to January 1, 1911. Chicago: Press of the American Medical Association. 1911. Price, paper 25c; cloth 50c.

This is the 1911 edition of the Annual New and Non-Official Remedies, issued by the Council of Pharmacy and Chemistry of the American Medical Association, and contains descriptions of all articles approved by the Council up to December 31st, 1910. There are also descriptions of a number of unofficial non-proprietary articles which the Council deemed of value. The action, dosage, uses and tests of identity, purity and strength of articles are given.

Verhandlungen des Vereins Deutscher Laryngologen 1911. Herausgegeben vom Schriftfuehrer Dr. Richard Hoffmann-Dresden. Wuerzburg: Curt Kabitzsch. 1911. Price, 7m.

The transactions of the Society of German Laryngologists truly represent the annual progress in the special field of laryngology. The volume just issued contains the 31 papers read before the last meeting of this distinguished society held in Franfurt-on-the-Main in May, 1911.

BOOKS RECEIVED.

THE MEDICAL EXPERT AND OTHER PAPERS. By Louis J. Rosenberg, New York: Broadway Publishing Co. Price, 25 cents.

L'ANAPHYLAXIE. Par Charles Richet, Professeur a la Faculte de Medecine de Paris. Paris: Librairie Felix Alcan. 1911.

WHAT TO EAT AND WHY. By G. Carroll Smith, M. D., Boston, Mass. Philadelphia and London: W. B. Saunders Company. 1911. Price, $2.50.

L'ANESTHESIE LOCALE EN DENTISTERIE OPERATOIRE. La Novocaine. Par Ch.—J. Fleischmann. Avec une preface de M. le Dr. J. Tellier. Paris: Octave, Doin et Fils. 1911.

APPLIED ANATOMY AND ORAL SURGERY FOR DENTAL STUDENTS. By Robert H. Ivy, M. D., D. D. S., Assistant Oral Surgeon at the Philadelphia General Hospital; Assistant Surgeon, Out-Patient Department, University, Philadelphia. Illustrated. Philadelphia and London: W. B. Saunders Company. 1911. Price, $1.50.

THE SOCIAL EVIL IN CHICAGO. A Study of Existing Conditions, with Recommendations by The Vice Commission of Chicago, a municipal body appointed by the Mayor and the City Council of the City of Chicago, and submitted as its report to the Mayor and City Council of Chicago. Chicago: Gunthorp-Warren Printing Company. 1911.

SCIENCE IN THE KITCHEN. By Ella Eaton Kellogg. A Scientific Treatise on Food Substances and their Dietetic Properties, together with a Practical Explanation of the Principles of Healthful Cookery. A Thousand Choice, Palatable, and Wholesome Recipes. Revised and Enlarged Edition. Battle Creek, Mich.: Good Health Publishing Co. 1910. Price, $3.00.

LEHRBUCH DER ALLGEMEINEN PATHOLOGIE UND DER PATHOLOGISCHEN ANATOMIE. Von Prof. Dr. Hugo Ribbert, Ordentlichem Professor der Allgemeinen Pathologie und der Pathologischen Anatomie und Direktor des Pathologischen Institutes der Universitaet Bonn Geh. Med.-Rat. Mit 848 Figuren. 4 Auflage. Leipzig: Verlag von F. C. W. Vogel. 1911. Price, paper, 16m., cloth, 18m.

REFRACTION AND VISUAL ACTIVITY. By Kenneth Scott, M. D., C. M., F. R. C. S. Edin., Consulting Ophthalmic Surgeon to St. Mary's Hospital for Women and Children, London, E.; Late Lecturer on Ophthalmology West London Post-Graduate College; Professor on Ophthalmology, Egyptian Government Medical School, etc. With sixteen illustrations and a coloured plate. New York: Rebman Company. 1911. Price, $1.75.

COMPENDIUM OF REGIONAL DIAGNOSIS IN AFFECTIONS OF THE BRAIN AND SPINAL CORD. A Concise Introduction to the Principles of Clinical Localization in Diseases and Injuries of the Central Nervous System. By Robert Bing, Privat-Docent for Neurology in the University of Basle. Translated by F. S. Arnold, B. A., M. B., B. Ch. (Oxon.). Revised by David I. Wolfstein. With seventy illustrations. New York: Rebman Company. Price, $2.50.

A POCKET MEDICAL DICTIONARY giving the Pronunciation and Definition of the Principal Words used in Medicine and the Collateral Sciences. Including very complete tables of the arteries, muscles, nerves, bacteria, bacilli, micrococci, spirilla, and thermometric scales, and a new dose-list of drugs and their preparations, in both the English and metric systems of weights and measures, based upon the Eighth Revision U. S. Pharmacopoeia, also a veterinary dose table. By George M. Gould, A. M., M. D., Author of "The Illustrated Medical Dictionary," etc. Sixth Edition, Revised and Enlarged. 34,000 words. Philadelphia: P. Blakiston's Son & Co. 1911. Price, $1.00.

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